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Experience of the Armed Forces Institute of Pathology in Aircraft Accident Investigation, 1956-1960*

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SINCE 1956, the Aviation and Forensic Pathology Section and the Aerospace Pathology Branch of the Armed Forces Institute of Pathology (AFIP) have studied and reviewed approximately 2,000 cases of military and civilian personnel involved in fatal aircraft accidents. AFIP personnel have investigated 28 military and 12 civilian aircraft accidents at the crash sites.

Many problems confront those interested in aircraft accident investigation. Accident investigation in remote areas by physicians and pathologists with little interest have failed to yield conclusive results in many cases. Failure of cooperation between the Air Force Flight Surgeon and pathologists of civilian and other military services has resulted in lack of coordination in the reconstruction of the material and human factors which resulted in the fatal accident.

The introduction of commercial jets in British air transportation in 1954 had, as we recall, tragic results. The Comet accidents appalled those planning for the future development of large jet aircraft transportation. The report by Armstrong et al.[1] in 1955 of the pathologic investigation of the passengers in the aircraft, along with the reconstruction of the wreckage recovered from one of the Comet aircraft and testing of other similar type aircraft, revealed the true nature of the structural defect which resulted in the type of trauma the passengers suffered.

This investigation provided the stimulus for a meeting held at the AFIP in March 1955, which was attended by aviation representatives of the Armed Forces of the United States, Canada, and the United Kingdom. The purpose of this meeting was to explore ways and means of counteracting the rising toll of aircraft accident fatalities in the three represented nations. As a result of the meeting, the Department of Defense[2] directed the establishment of the Joint Committee on Aviation Pathology, with the AFIP as the central coordinating facility for the investigation of the pathology of fatal cases in aircraft accidents. The AFIP then established the Aviation Pathology Section, integrating it with the already existing Forensic Pathology Section. Because of the large number of cases, it became necessary in 1959 to reorganize the Section, and a new Division was created:

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the Military Environmental Pathology Division, with three Branches, the Aerospace Pathology Branch, the Forensic Pathology Branch, and Wound Ballistic Branch.

Realizing the important role of biochemical support for the study of aircraft accident fatalities, a toxicology laboratory was established in the Aerospace Pathology Branch in 1956. This laboratory utilizes very sensitive tests for the analysis of blood and tissue to determine levels of toxic substances to which flying personnel may be exposed.

The AFIP personnel studying aircraft accidents have contributed a considerable amount of the literature relating pathology to aircraft accident fatalities.

Early in these investigations it was obvious that for a total understanding of the "man-aircraft" relationship three major factors must be considered: (1) environmental factors, (2) traumatic factors, and (3) pre-existing disease factors. Table 1 presents some important items to be considered under the major factors.

TABLE 1

FACTORS AFFECTING THE "MAN-AIRCRAFT" RELATIONSHIP

Environmental factors
Altitude—Hypoxia, decompression
Speed—G forces, spatial disorientation, blast
Toxins—Carbon monoxide, fuels, odors
Temperature—Excessive heat, cold, humidity
Noise—Auditory effects, vibration
Stress—Pathology of terror
Traumatic factors
Protective equipment
Escape
Aircraft design
Pre-existing disease

Experience with aircraft accidents has brought us to certain obvious conclusions. First, flying at high altitudes and great speeds requires the construction of the best aircraft possible, with all the necessary equipment provided to render an environment within the machine itself that will sustain a living human being safe from the physiologic hazards present only inches away. Second, if escape from the aircraft becomes a necessity, adequate devices must be provided to assure safe exit and descent. Third, if pre-existing disease is present and undetected, the role it played in any aircraft accident must be determined.

ENVIRONMENTAL FACTORS

Hypoxia. Among the environmental factors, one of the most important problems is the postmortem diagnosis of acute antemortem hypoxia. The lack of suitable histopathologic criteria prompted studies at the Royal Canadian Air Force Institute of Aviation Medicine[3] and later at the School of Aviation Medicine, U. S. Air Force, Aerospace Medical Center,[4] to explore some means of detecting antemortem hypoxia in postmortem tissue. Through this joint effort, a test on postmortem tissue was devised utilizing the content of lactic acid in the postmortem central nervous system (CNS) tissue to indicate the existence of acute antemortem hypoxia. This test looked promising in experimental animals and, therefore, a program was initiated at the AFIP to explore the value of determining the level of lactic acid in postmortem CNS tissue in aircraft accident fatalities.

Frozen, nonfixed tissue from victims of aircraft accidents is submitted to the Armed Forces Institute of Pathology by the U. S. Air Force, Navy, and Army. Since October 1956, the brain lactic acid level has been determined in these cases. Within the experimental confines of the test, lactic acid levels over 200 mg. % in brain tissue were considered indicative of hypoxia, although the elevated value did not distinguish between the causes of the hypoxia.[5,6] In 930 aircraft accident cases in which this test was routinely performed at the AFIP from October 1956 to November 1960, there were 86 instances in which a value over 200 mg. % was obtained. In 7 instances there was definite evidence that the elevation was due to altitude hypoxia, in 42 there was history of short survival in a shock state following the accident, in 9 suffocation was the cause, in 15 instances drowning was responsible, in 5 no history was available, in 5 cases there was doubt as to the cause, and in 1 there was a

possibility of either hyperventilation or hypoxia.[7] One case illustrates the value of this test.

Case 1 (AFIP Accession No. 916567). A Navy pilot with 2,030 hours' total flight time took off in a Navy T2V trainer at 1005. Thirty-eight minutes later, the pilot made a VFR position report. Altitude was 35,000 feet. Sixty-six minutes later he made another routine VFR position report. Seven minutes after the latter position report, witnesses stated they observed an aircraft descending and apparently out of control. The airplane crashed in a wooded area at 1117, the time the clock in the front cockpit stopped. Examination of the impact area indicated a steep downward path 60 to 70 degrees, with left wing down and nose down on impact. The wreckage was in one general area and formed a pattern indicative of striking the ground in a left spin. The aircraft burned after impact. There was no evidence that the pilot attempted to eject.

Pathology examination: An autopsy was performed at Bethesda Naval Hospital. The brain was totally avulsed, and the body was severely burned. There was very severe trauma, with partial amputation of all limbs.

Spinal cord tissue was removed and sent to the AFIP Toxicology Laboratory for lactic acid determination. The lactic acid level was reported at 270 mg. %. This indicated that the pilot was probably incapacitated due to hypoxia. The medical officer's thorough examination of the accident site indicated that there was no attempt to eject. In his opinion the pilot was probably developing hypoxia over a period of 20 to 30 minutes prior to the time of the crash.

In previous years without this procedure for determination of lactic acid in central nervous system tissue, this accident would probably have been placed in the category of "cause undetermined." The Naval investigating board's examination revealed no mechanical failure.

Toxins. A great deal of time has been devoted to the environmental problem of toxins, e.g., carbon monoxide. Since blood frequently is not available for analysis in aircraft accident fatalities, it is necessary to use tissue for the determination of carbon monoxide. At present, the AFIP is utilizing gas-solid chromatography for the analysis of carbon monoxide.[8,9] This apparatus will separate any unknown mixture of gases into its component gases and release them at separate time intervals. The per cent carboxyhemoglobin (COHb) in an aqueous extract of tissue is determined by comparing the peak heights of CO content and CO capacity. The use of gas chromatography has proved to be accurate, sensitive, and specific for CO. In the period from 1 May 1957 to 31 October 1960, 1,303 cases of aircraft accident fatalities were examined at the AFIP for the presence of carbon monoxide (Table 2). Of these cases, 126 showed CO levels of 10% COHb or over. All cases showing

TABLE 2

CARBON MONOXIDE IN AIRCRAFT ACCIDENT FATALITIES
1 May 1957 to 1 April 1960

Saturation	Number of Cases	Per Cent
Less than 10%	1,177	90.3
10–20%	77	5.9
21–30%	20	1.5
31% and over	29	2.3
TOTAL	1,303	

COHb levels over 10% saturation have been carefully analyzed and evaluated on the basis of autopsy protocols and accident histories. All aircraft accident victims with COHb levels above 10% saturation were shown to have been alive at the time of a fire, either in-flight or subsequent to impact. In no case of "cause undetermined" accidents was there an unexplained elevation of COHb.

Carboxyhemoglobin levels between 6% and 9% saturation indicate the possibility that the subject was alive at the time of exposure to fire. However, these cases should be cautiously evaluated, because it is known that heavy smoking can raise the carboxyhemoglobin to similar levels. Extensive fragmentation and postmortem incineration of tissues subsequent to explosive impact

forces do not elevate the carboxyhemoglobin saturations. In this 2-year period, no cases were found in which carbon monoxide intoxication has been implicated as the cause of an aircraft accident. Carbon monoxide analyses are still performed routinely, however, on all aircraft accident fatalities to determine whether or not the individuals were alive or dead at the time of the fire. This information is useful in determining the sequence of events in an accident and in analyzing the problems of escape from a damaged aircraft.

Traumatic Factors

In the consideration of traumatic factors we are concerned primarily with the protective equipment within the aircraft, the escape mechanism, and the aircraft design. We very recently had an interesting case involving one of our latest types of aircraft. This presents a problem of failure of protective equipment with which we are faced now and which might well have been prevented by previous experimental studies performed in 1957 at the Aero Medical Laboratory. Experiments using chimpanzees in rapid acceleration and deceleration were performed. At speeds well above Mach 1.0 the animals were rapidly decelerated and underwent the stress of 80 to 100 G. The animals suffered severe windblast burns in exposed areas, and protective clothing was ripped away. A majority of them did not survive.

Case 2 (AFIP Accession No. 962491). A B-58 aircraft being flown by a civilian test crew was flying at 42,000 feet near thunderstorm activity with cloud tops reaching an elevation of 50,000 feet. Six minutes before crash the pilot reported no difficulty and stated the intention of beginning an acceleration run. The aircraft impacted in an inverted attitude at an estimated 70-degree angle at a speed of Mach 1.2 to 1.4, disintegrating in a crater 60 feet in diameter and 30 feet deep. Witnesses stated that all three parachutes opened normally and descent was at normal speed. The members of the investigating board estimated that the ejection of the three crew members took place over a period of 11 seconds and from altitude levels of from 26,000 to 16,000 feet.

At autopsy the significant findings were as follows (for clarity, only one crew member's injuries will be described): Deep macerated pit marks over front and sides of face and body, separation of pubic symphysis, fractures of left leg, and dislocation of right knee. The flying clothing was ripped off, and severe edema of periorbital region was present. Abdominal and thoracic organs were intact. Microscopic examination revealed severe cerebral congestion and edema with multiple petechial hemorrhages. The cause of death was the severe cerebral damage and multiple fractures with hemorrhage in the pelvic tissues.

A summary of the aircraft accident was prepared by Colonel John P. Stapp, USAF, MC. The following is an extract of Colonel Stapp's comments.

"The head rest shows multiple screwhead punctures indicating rapid side to side buffeting of head with helmet screws puncturing the head rest. The separation of the pubic symphysis, left leg fractures and right knee dislocation correspond to failure of the leg retaining straps with upward and backward flailing of the legs. Boot polish markings were found on the left of the seat and head rest. The ripping of the flying clothing indicates an initial windblast pressure of about 1,000–1,500 pounds per square foot. The remaining clothing was tattered and punctured through all layers by hailstone impacts. The upper facial edema is consistent with initial abrupt, forward-facing deceleration. The autopsy findings regarding cause of death are concurred in."

Colonel Stapp's comments reconstructed the entire accident sequence. He further indicated that one crew member was pulled from his seat by a force estimated at 6,000 pounds or more by windblast, prematurely deploying the parachute. The conclusions were that "injuries caused by failure of head, arm, and leg restraints with resultant flailing in windblast higher than Mach 1 and between 1,000 and 1,500 Q [pounds per square foot] were the cause of death as determined from the autopsy."

Pre-Existing Disease

The most frequent pre-existing disease process found in fatal aircraft accidents is some degree of coronary artery atherosclerosis. This aspect of AFIP experience has been well covered by Glantz and Stembridge.[10] More recently we have encountered an increase in private light plane fatalities involving men in the late fourth and fifth decades of life. To cite one case briefly, a 54-year-old pilot was flying his own light plane, which was observed to assume unusual attitudes. Shortly thereafter the pilot was seen to be slumped forward over the controls by another pilot flying nearby. The plane crashed and burned. Autopsy revealed an old thrombus in the left coronary artery, with myocardial fibrosis. Acute coronary insufficiency was the most likely cause of the accident, in view of the history given by the eyewitness. It was later learned that the pilot went to one physician for his flying examination and to another physician for his heart disease.

Discussion

These case reports present a brief sample of the multitude of fatal aircraft accidents we have encountered. The loss in personnel from the humanitarian aspect is immeasurable. The materiel loss is astounding.

The case of hypoxia reveals one area in which pathology and toxicology are making inroads into the realm of the "cause undetermined" accident. The supersonic aircraft accident investigation report reveals the lucid picture that can be drawn from the autopsy and a thorough investigation of remnants of an aircraft. This can only be done when the flight surgeon and the pathologist perform the investigation with one aim—to determine the sequence of events that led to the fatal trauma. The investigation must elucidate the necessary modifications in the aircraft and crew survival equipment to prevent a future similar fatality.

We believe, after 5 years of experience in the pathology of aircraft accident fatalities, that we have contributed a better understanding of the total "man-aircraft" relationship under adverse conditions.

We are justified in this belief by a recent increase in interest in our work by military and civilian pathologists in this country. We now have four foreign allied officers in the Aerospace Pathology Branch reviewing our material; one is a surgeon general, one an assistant surgeon general, and two are flight surgeons. We have much to learn from our cases in accession, and this mass of information must be reviewed diligently. With our experience in firm grasp, we must now face a new and more exotic challenge—the pathology of outer space.

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Operational Toxicology in the Navy*

By

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(With five illustrations)

The rapid development of new materials and military chemicals and the concurrent development of nuclear-powered submarines and space vehicles, has necessitated the search for a new body of toxicity data and a new frame of reference. As a result of this need the U. S. Navy Toxicology Unit was established. This paper describes the mission of the new unique unit, and outlines some of the assignments completed during 1960 as a direct assist to fleet operations.

THE Navy Toxicology Unit started operations just about a year ago with a single objective, namely to provide rapid, practical answers in the area of toxicology and health engineering to the forces afloat.

There were three basic reasons for establishing the unit:

First, there was an urgent need for the development of data for 90 day continuous exposure to air contaminants. Nuclear powered submarines, mated with Polaris Missiles, have resulted in extremely mobile bases which can remain submerged for prolonged periods of time. Concurrent with the development of this remarkable new weapons system, a new set of health problems have been generated. Because crews have to remain submerged for months at a time, an active habitability program was inaugurated in 1957. The fleet ballistic missile ships are air conditioned; air scrubbers and electrostatic precipitators are used to remove particulate matter and gaseous irritants; oxygen systems enable the submarines to provide their own habitable environment. Despite this, a large number of contaminants are constantly present in the atmosphere. The 8 hour per day, 40 hour per week threshold limits utilized as guidelines in industrial exposures were simply not applicable to exposures anticipated aboard Fleet Ballistic Missile submarines and other confined spaces. From a logistics point of view, all planning had to be done based on long-term "sealed condition" submergence runs with no opportunity to snorkel, or ventilate the submarines. Hence a new frame of reference was needed.

The second reason for establishing the unit was the inability to get this work done through contract with universities. Continuous exposure studies posed difficult administrative problems to universities because of the 3 shifts which would be involved.

The third basic reason was that there was need for a team to be in a constant state of readiness to go aboard ship and to troubleshoot whenever necessary. It was felt that a small independent unit could move fast and could therefore service our customers on short notice.

MECHANISMS AVAILABLE TO THE BUREAU OF MEDICINE AND SURGERY

Table 1 and figure 1 are presented in order to bring our unit into proper perspective.

TABLE 1

TOXICOLOGY MECHANISMS AVAILABLE

1. Committee on Toxicology (National Research Council)
2. Army Chemical Center
3. O.N.R. Contracts (Universities and Private Laboratories)
4. Medical Research Laboratories
5. SECNAVINSTR 6260.2 of 7 November 1955
6. Advisory Center on Toxicology
7. Navy Toxicology Unit

* Presented at the 67th Annual Meeting of the Association of Military Surgeons of the United States held in Washington, D. C., October 31, November 1 and 2, 1960.

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Table 1 shows the five mechanisms in toxicology which are being effectively used by the Bureau of Medicine and Surgery to resolve these problems. It should be noted that the Navy Toxicology Unit is only one of these mechanisms.

Figure 1 is a schematic drawing of how the Secretary of the Navy instruction works. It is a planned approach set up by the Bureau of Medicine and Surgery for the resolution of urgent toxicological problems. Here, again, the Toxicology Unit is only one part of a large capability.

Before getting into the unit story it may be well to note that our entire program deals with military chemicals. Many of these chemicals and related materials are new; others are well known substances being used in a new way. Some are exotic in nature like the high energy fuels, others are run-of-the-mill compounds like carbon tetrachloride and Freon. They all have a common denominator in that toxicity is an unwanted property. It should also be noted that we are not involved in the evaluation of drugs or medicinals used in the treatment of disease, nor are we involved in the evaluation of chemical warfare agents or gases.

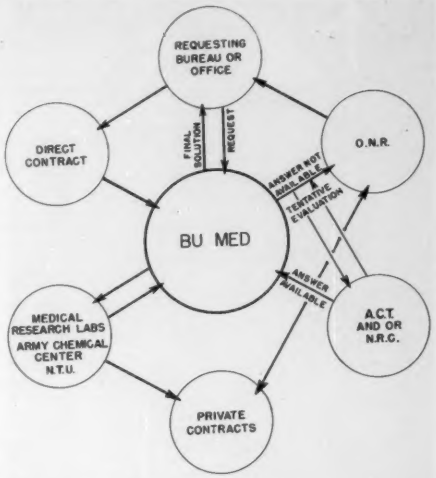


FIG. 1. Schematic showing how requests for information are handled.

THE UNIT STORY

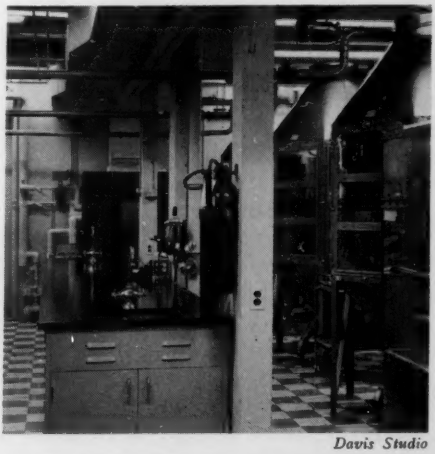
The Navy Toxicology Unit is located at the National Naval Medical Center. It is a small unit composed of 17 men (10 Hospital Corpsmen, 4 Medical Service Corps Officers, 1 Secretary and 2 Animal Keepers).

Its 3600 square feet is divided up into five (5) major areas:

1. Inhalation Chamber Area
2. Oral and Skin Toxicity Rooms
3. Pathology Laboratory
4. Chemistry Laboratory, and an
5. Instrumentation Laboratory.

MISSION

The mission of the unit as stated by the Secretary of the Navy is "To provide technical and specialized services in the fields of Operational Toxicology and Health Engineering as related to toxicity problems encountered aboard ships; and in the design and use of new weapon systems. Also, develop and provide biological data necessary for determining permissible limits so that precautionary measures, conducive to good health practices, may be prescribed." Emphasis has been placed on the Polaris Mission but work has been done for all Bureaus. All of our work is operational in nature, and not basic research. In February 1960 the Bureau of Medicine and Surgery delegated our unit as



Davis Studio

FIG. 2. View of Inhalation Chamber Area showing the Rochester type units.

Davis Studio

FIG. 3. View of Inhalation Chamber Area showing three Rochester type units and an NMRI rectangular unit.

the lead laboratory in Toxicology in the field of Bio-Astronautics. It is one of the objectives of the Navy Toxicology Unit to help take many of the present tentative standards out of the realm of "guess estimates" and place them on a factual basis. To this end, major emphasis has been placed on long-term inhalation studies.

We have a battery of eleven exposure chambers, designed for continuous inhalation studies. Six (6) of these are specially designed Rochester type units; the other five (5) are square chambers inherited by the unit from Naval Medical Research Institute.

Figures 2, 3 and 4 are presented in order to illustrate the type of exposure chambers being used. All of these chambers are air-conditioned and are instrumented for temperature, humidity, air-flow, chamber pressure, compressed air pressure, and contaminant concentration. Four additional features worthy of note are:

(1) The rate of feed of the contaminant is controlled by the use of a Harvard infusion pump.

(2) This equipment can be used to generate mist, gases, dusts or combinations of these contaminants.

(3) The particle size is controlled.

(4) Air samples are taken at fixed points.

The chambers are opened a maximum of 15-20 minutes per day in order to feed the animals and clean the chambers. To facilitate interim cleaning with the chamber doors closed, we have installed a shower ring system which can be activated from the outside. With this set-up we have exposed animals (dogs, chickens, rats, monkeys, guinea pigs) to a number of suspect materials for as long as 177 days.

To date we have completed 10 long-term inhalation runs on three (3) materials. One of these materials was a triaryl phosphate hydraulic fluid, in the same family as triorthocresyl phosphate which caused the well-known Ginger-Jake Paralysis in the thirties, and more recently about 10,000 paralytic cases in Morocco. This hydraulic fluid was of immediate concern because of its proposed use aboard Polaris Submarines. These runs on the hydraulic fluids are summarized in Table 2 and Figure 5.

As can be seen from Table 2 chickens

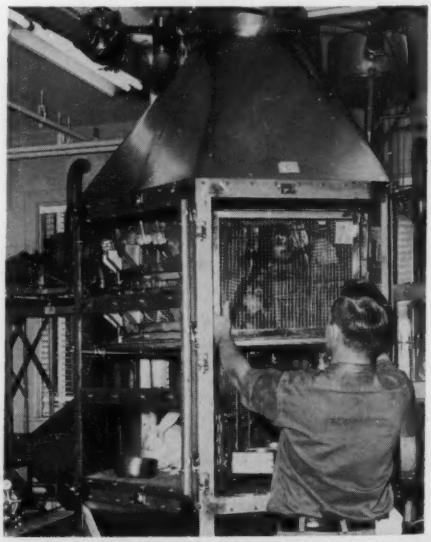


FIG. 4. Close-up of Rochester type unit.

TABLE 2

SUMMARY OF EXPERIMENTS WITH SAFETY-TYPE HYDRAULIC FLUID (TRI-ARYL PHOSPHATE) *CELLULUBE 220*

Exp. No.	*Conc mg/M³*	*Paralytic Effects Noted*							
		Chickens		*Monkeys*		*Rabbits*		*Dogs*	
		Symptoms	*Day*	*Symptoms*	*Day*	*Symptoms*	*Day*	*Symptoms*	*Day*
NMRI	1	+	42	No	90	–	–	–	–
NTU-13E	2	+	100	–	–	No	135	No	177
NTU-13F	2	No(±)	93	–	–	No	120	No	159
NTU-23A	5	No	100	No	100	No	100	No	100
NTU-23B	5	No	100	No	100	No	100	No	100
NMRI	15	+	35	No	90	–	–	–	–
NTU-13D	15	+	58	–	–	No	162	No	162
NTU-13C	30	+	65	–	–	No	156	No	156
NTU-13A	83	+	29	–	–	+	19–26	–	–
NTU-13B	110	+	22	–	–	–	–	–	–
NTU-13G	125	+	23	–	–	+	37	No	100

are very susceptible to this material at extremely low concentrations. Monkeys, rabbits, and dogs are quite resistant. Dogs exposed continuously for 159 and 177 days to a mist of this fluid at a concentration of about 2 mg. per cubic meter, or for 100 days at 125 mg/m³, showed no ill-effect.

Figure 5 shows a plot of the various runs, and the effects noted in chickens. It can be seen that we have approached the "No-Effect" level at about 2 mg. per cubic meter. This, in the final analysis, is the level we are seeking; a level at which Naval Personnel will not only be protected from air contaminants which might lead to occupational disease, but a level which will permit personnel to function without any degradation in performance.

So much for the animal inhalation work. In addition we do the standard oral toxicity

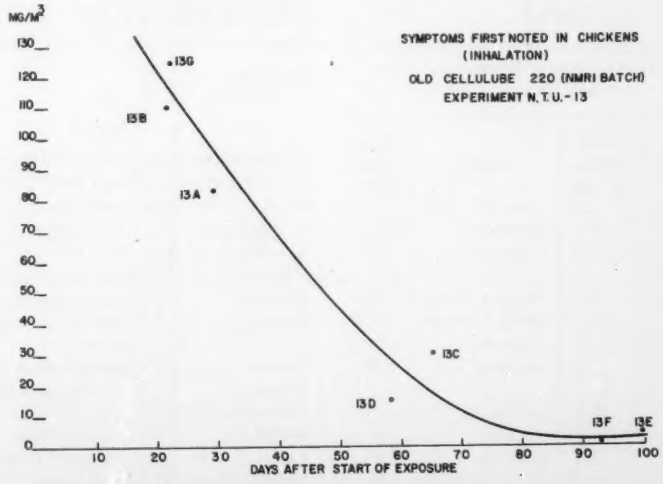


FIG. 5. Concentration plotted against the time paralytic symptoms were first noted in chickens.

TABLE 3

COMPOUNDS QUANTITATIVELY IDENTIFIED IN SUBMARINE ATMOSPHERES

Material and type Sub in Which Used	*Highest Conc. Found*	*Material and Type Sub in Which Used*	*Highest Conc. Found*
Acetylene (N)*	0.5 ppm	Hydrogen (F, N)	1.75 %
Ammonia (N)	1 ppm	MeOH (N)	6 ppm
CO_2 (F, N)	1.1 %	MEA (N)	1 ppm
CO (F, N)	38 ppm	NO_2 (N)	0.1 ppm
Chlorine (F, N)	1 ppm	N_2O (N)	27 ppm
Freon-12 (F, N)	70 ppm	Oxygen (F, N)	20 %
"Hydcns" (F, N)	25 ppm	Stibine (F, N)	1 ppm
Methane (F, N)	118 ppm	H_2O vapor (F, N)	60 % R.H.
HF (N)	0.3 ppm	"Cig smoke" (F, N)	0.4 μg/1

* (F = Fleet); (N = Nuclear). Taken from NRL Report 5456.

and skin irritation studies to help set parameters for proper handling of toxic materials. To date we have completed oral and skin studies on twelve (12) materials.

FIELD AND LAB WORK

A major portion of our mission involves studies aboard ship, at Cape Canaveral, and at other trouble-spots in the field. Teams from our unit have participated in the first firings of the Polaris, from the Ship Motion Simulator at Cape Canaveral, and from the USS *Observation Island*. Tests have been made for combustion products such as carbon monoxide and hydrogen chloride. We have also participated in a number of studies aboard submarines involving air contaminants generated by high-pressure air compressors.

Another type of study engaged in by our unit is the simulation of contaminant conditions in the battleship compartment at NMRI. One such study involved the replacement of oil-based paint with a water-based paint. As a result of this relatively short study—about 3 weeks—we were able to advise the operating fleet that it was safe to submerge without hazard to health 72 hours after painting. A similar study with malathion indicated that no residual malathion in air could be detected 24 hours after spraying.

TABLE 4

COMPOUNDS QUALITATIVELY IDENTIFIED IN TRACE AMOUNTS IN SUBMARINE ATMOSPHERES

Material	*Type Sub-marine*	*Material*	*Type Sub-marine*
Arsine	F*	Mesitylene	N
Benzene	N*	Propane	N
1-3-Dimethyl-5-ethylbenzene	N	Pseudocumene	N
Ethylene	N	Sulfur Dioxide	F, N
p-Ethyl Toluene	N	Toluene	N
Freon-114	N	o-xylene	N
"Gasoline vapors"	F	m-xylene	N
Hydrogen Chloride	N	p-xylene	N

* F = Fleet; N = Nuclear. Taken from NRL Report 5456

TABLE 5

COMPOUNDS SUSPECTED AS PRESENT BUT NOT IDENTIFIED IN SUBMARINE ATMOSPHERES

Material	*Suspected Source*
Formaldehyde	Oxidation of Methyl Alcohol
Mercury	Meters & Gauges
Ozone	Electronic & Electrical Equipment
Acrolein	Cooking Fats & Greases
Phosgene	Degradation of Freon
Hydrogen Sulfide	Waste Tanks
Radon, etc.	Luminous Dials
Cellulube 550	Hydraulic Fluids
Sodium Bisulfate	CO_2 Scrubber

Taken from NRL Report 5456.

TABLE 6

TOXICITY EVALUATION OF MATERIALS FOR NUCLEAR SUBMARINES

Material	Rep't. No.	Vapor Press. mm Hg	Max. Air Conc. per per 10^4 Cu. Ft. ppm	Toxicity Rating 0–4	Principal Local Effects Normal Use			CNS	Principal Systemic Effects Over-Exposure	Estimated Tolerance Values						
					Eye	Skin	Lung		Other Systems	40 Hour Week TLV ppm	1 Hour Limit ppm	8 Hour Limit ppm	24 Hour Limit ppm	30 Day Limit ppm	60 Day Limit ppm	90 Day Limit ppm
Cellulube 220	6	Not Known	—	4	N	N	N	N	↓ Pl. Cholinesterase Polyneuritis, N·V·D	None Set	-Not Required-			0.6	0.3	0.06
Mercury	2	0.002 26° C	21.5 Mg/M³ per >6 G.	4	N	N	N	N	Neural & Muscular Disturbances	0.1 Mg/ Cu.M.	5.0 Mg/ Cu.M.	2.0 Mg/ Cu.M.	2.0 Mg/ Cu.M.	0.10 Mg/ Cu.M.	0.05 Mg/ Cu.M.	0.05 Mg/ Cu.M.
Methanol	35	130 25° C	80000/10 Gal.	4	S	S	N	↓	Optic Nerve Damage Acidosis	200	1000	500	100	10	5	3
Monoethanolamine	16	0.4 25° C	500/0.1 Gal.	1	S	S	S	↓		None Set	100	20	5	0.5	0.25	0.15
Ozone	46	Gas		3	S	N	S	N	Pulmonary Edema	0.1	1.0	1.0	0.1	0.05	0.05	0.05

Prepared by the Advisory Center on Toxicology.

It should be pointed out that the data being developed is applicable to any confined space—whether it be in a submarine, in an aeroplane, or in a space capsule. All data is reported to the Advisory Center on Toxicology so that it can be made available to the three military services.

So much for the past. Tables 3, 4 and 5 give some idea of the magnitude of the problem pertaining to submarines. From lists of this type we screen out those materials of immediate interest and concern, and concentrate our efforts on key compounds with serious toxicological implications.

The Advisory Center on Toxicology and the Committee on Toxicology of the National Research Council have worked very closely with the Bureau of Medicine and Surgery on the submarine problem. Table 6 is an illustration of the end point of this effort. About 40 materials have been worked on to date.

Summary

Due to the peculiar nature of our times, calculated decisions are being made to go into production on new weapon systems long before research and development projects are completed. This has not only markedly reduced the lead time in the development of these new weapons systems but has also necessitated the formulation of decisions in toxicology long before adequate toxicity data is available. This has been necessary in order to give ship designers and planners an opportunity to incorporate the best advice available in their ventilation, air-contaminant, and monitoring systems, so that a minimal health threat to Naval Personnel would exist when the new weapons system became operational.

As pointed out earlier, the Bureau of Medicine and Surgery has set up a planned approach for the resolution of urgent toxicological problems as they arise as well as the resolution of problems which could be anticipated prior to the time that these new weapon systems become operational. The Navy Toxicology Unit is only one part of this capability. All of our assignments come through the Research Division of the Bureau of Medicine and Surgery and it is our mission to assist BUMED in arriving at health standards which will not only prevent obvious serious medical diseases but will also prevent any degradation in performance which is so essential in our push-button age.

Bone Marrow Storage: Current Concepts*

By

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(With five illustrations)

INTRODUCTION

THE complex sequence of biological events following whole body irradiation, with its resulting pathology, has been a problem of medical interest since the onset of the nuclear era. The treatment of these pathological alterations is of maximal interest on two accounts: (1) the need to cope with whole body exposure to radiation associated with unanticipated civilian and/or military emergencies, and (2) the potential use of high levels of whole body irradiation for therapeutic purposes.

It has been established that mammals exposed to increasing doses of whole body irradiation will die at decreasing time intervals. This relationship is shown in Figure 1. It is possible to classify the biological effects of radiation into three broad groupings: (1) sublethal—not all of the irradiated animals will die even if not treated, (2) lethal —all of the irradiated animals will die in a certain period if not treated, and (3) supralethal—all of the irradiated animals will die regardless of treatment available at this time. As in any other grouping situation, it must be realized that there are many subgroups within the ones presented.

Death following irradiation usually involves one or more of the following mechanisms: hematopoietic depression, intestinal injury, and central nervous system damage. The latter is the most serious and is characteristic of supralethal doses of radiation. The irradiated animal succumbing to hematopoietic depression may die of anemia, hemorrhage or infection. However, animal experimentation has demonstrated that if lethally irradiated animals are treated with an intravenous suspension of bone marrow, they will survive. Figure 2 demonstrates the protective effects of bone marrow treatment. This method of therapy has been used to advantage in the survival of mice,[1] rats,[2] guinea pigs,[1,3] hamsters,[4] rabbits,[5] dogs[6] and monkeys[7] following exposure to lethal whole body irradiation. There have been reports of this therapy being successful in humans;[8,9] however, there continue to be some reservations about the results in these cases. In addition to bone marrow, cell-free extracts[10] and spleen homogenates[11] have been reported to be effective in enhancing the survival of irradiated animals. At this time, bone marrow appears to be the most favored regimen for the treatment of whole body irradiation. It has been proposed that injected bone marrow is delivered to areas of depressed marrow and repopulates the marrow spaces, thereby producing new marrow elements.[12]

The source of the marrow is considered most important. Therefore, we will define the terms utilized regarding the donor and recipient transplantation relationship. They are as follows:

Autograft—tissue taken from one operative site and grafted in another operative site in the same individual.

Isograft—tissue taken from one animal of a highly inbred strain and grafted to another animal of the same inbred strain. Such grafts behave similarly to an autograft.

Syngenesiograft—tissue removed from an individual and grafted to a blood relative, e.g., mother to daughter.

Homograft—tissue taken from one individual and grafted to another individual of the same species.

* From the Tissue Bank Department, U.S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md.

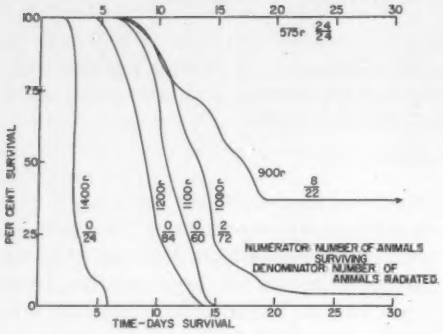

FIG. 1. The effect of varying doses of Co_{60} radiation on the survival of F_1 (C_3HxC) mice.

Brephoplasticgraft—tissue taken from an embryo of a given species and grafted to an adult of the same species.
Heterograft—tissue taken from a member of a given species and grafted to a member of a different species.

Two more terms which are appropriate in bone marrow therapy are:
Orthotopic—tissue transplanted to an anatomical area similar to that from which it was derived.
Nonorthotopic—tissue transplanted to an anatomical site not normally occupied by that tissue.

The nonorthotopic method of intravenous infusion reputedly ends as an orthotopic graft. It seems possible that many of the infused marrow elements might be filtered from the blood stream in the venous-arterio transport prior to "repopulating" the marrow spaces. Orthotopic transplant, the direct transplant of bone marrow, would theoretically circumvent the problem of filtering and would place the marrow in the area where it is to provide its physiological activity. This approach as originally reported by Rekers[13] is presently being investigated at the Naval Medical Center.

The procurement of bone marrow will, of necessity, vary according to the method of infusion anticipated, i.e., orthotopic or nonorthotopic.

Figure 3 demonstrates the areas of red marrow in the adult and suggests the potential sites for the collection of marrow for storage. The marrow is aspirated into a syringe containing heparin prior to its final

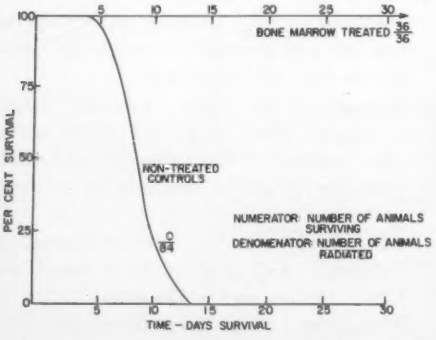

FIG. 2. Comparison of the survival of treated and untreated F_1 (C_3HxC) mice following lethal irradiation (1200r-Co_{60}).

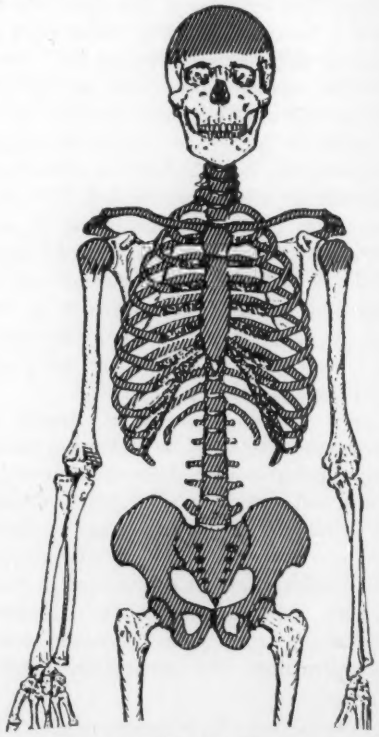

FIG. 3. Anatomical sites of red bone marrow. The usual sites for procurement are the posterior ilium, sternum and vertebrae.

processing and storage. The technics employed for the aspiration of marrow from the living donor have been adequately described elsewhere.[14]

The procurement of cadaver marrow is usually effected under direct vision of the marrow-containing area; therefore, the yield is of cancellous bone and the marrow components. The marrow elements are later removed from the bone spicules by a series of screens,[15] or by sedimentation as originally proposed for blood.[16]

Storage

The benefits associated with the use of marrow have been described for the treatment of lethal doses of whole body irradiation. Reliable methods for the storage of bone marrow must now be developed. At the present time two methods of bone marrow storage are being investigated, namely, nutrient media and protective freezing.

The nutrient media storage of human bone marrow as it is being developed in our department[17] is a logical extension of technics currently employed at the Tissue Bank for the short-term (6 weeks or less) storage of skin.[18]

The marrow is aspirated from the donor in the operating room, diluted with an equal volume of NCTC 109[19] solution,* collected in a storage vessel and immediately refrigerated at +4° C. Preliminary results with this type of storage[17] indicate that 75% of the viable cells can be maintained for periods up to 10 days. It is our goal to extend this period to 30 days by varying the temperature and the composition of media employed during the storage period.

Successful freezing of viable cells in preparation for long-term storage has generally been approached by the trial and error method of seeking an agent which affords "protection" at the optimal freezing rate for the particular cellular system. Unfortunately, no well defined common denominator permits application of one set of ideal freezing conditions to all types of cells. Nor is an additive's mechanism of protection well understood.

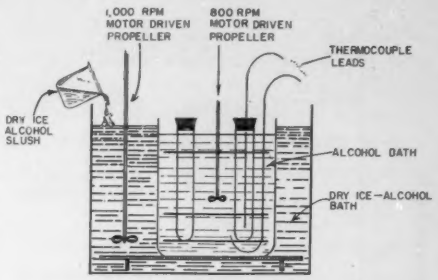

FIG. 4. Diagram of the apparatus employed for the uniform freezing of tissue samples.

Presumably, the two broad classifications of effects which lead to cell death during freezing are: (1) the type of ice crystals formed, and (2) the denaturing effect of increased concentrations of salts during the freezing process.

Polyhydroxy hydrocarbons and carbohydrate derivatives have enjoyed wide popularity as protective agents during the freezing of viable cells. Other additives, including inorganic salts,[20] have been studied in the case of bone marrow. A spectrum of sugars and other compounds in various concentrations have been studied for this purpose with encouraging results.[21] Protected freezing with glycerol[22,23] is the method of preservation employed by many investigators for the storage of bone marrow.[11,24,25,26]

Figure 4 diagrammatically describes the essentials of our laboratory freezing apparatus. This apparatus permits the reproducible freezing of uniform samples of marrow at 1° C. per minute with a maximum deviation of +0.5° C. in the mean cooling rate of the alcohol bath and ±1° C. in the test tubes containing the sample of marrow.

Published technics for the successful freezing of biological materials sometimes omit essential details. The statement that a sample was frozen to −79° C. does not adequately inform the interested reader. The freezing conditions which are generally critical for any system of cells should be defined; i.e., geometry and composition of the

* A solution made up of 72 ingredients, consisting of amino acids, vitamins, coenzymes, nucleic acids and the components of a physiological saline.

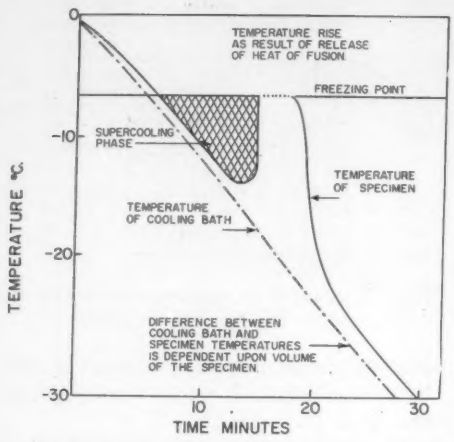

FIG. 5. A typical freezing curve for a 2 ml. sample of bone marrow suspension . . . the time duration of this plateau is dependent upon the volume of the specimen and geometry of the media vessel.

freezing container, rate of temperature change and, where possible, the temperature change should be substantiated and/or exemplified by thermocouple studies.

When the temperature of a solution is lowered from ambient to the temperature desirable for storage, a marked rise occurs near its freezing point. Figure 5 demonstrates the various zones observed during the freezing of a solution currently employed for our studies. The zones of this temperature rise have been defined by Glauser.[27] The temperature rise shown in this figure is a result of the release of the latent heat of fusion during ice crystal formation. While this is a very traumatic process, we noted that death of the cell population occurred during the return of the samples to the bath temperature following this rise. That is, 90-100 percent of the cells removed during the supercooling phase, the rise, the freezing plateau and the early decline survived when returned to room temperature. However, it was observed that in the absence of a protective agent or an adequate concentration of the agent, cells removed during the lower portion of the decline and all subsequent lower temperatures, were uniformly destroyed. This same response was reported by Taylor in his study of the effects of freezing on human skin.[28] Many investigators are presently studying this particular area of the freezing process and are attempting to modify the phase transition to permit successful freezing of the cell population.

In a consideration of the complexities of freezing, one should remember that this is a cyclic process and the effects of freezing should not be emphasized at the expense of the equally important effects of thawing. When viability is to be considered, the two effects are inseparable. It has been demonstrated[29] that when the conditions of freezing are kept constant, variables in the thawing procedure significantly affect the percentage of survival in the test samples. The two most influential factors observed during thawing of erythrocytes[29] are the rate of temperature change and the effects of agitation of the sample. We may generally consider that all of the detrimental changes imposed by the freezing step must be reconsidered during thawing.

Storage and Viability

In the case of lower animal studies, adequate biological indications of successful freezing procedures are available. Since such biological indicators are not available at this time for the study of human marrow, we must rely on laboratory tests in the evaluation of our technics.

The quality of the product must be considered when evaluating methods of storage. Apropos of this problem is a discussion of viability. At the present time, the functional capacity to protect against lethal radiation is presumed to be a corollary of the cell viability. We believe the inadequate qualification of the term "viability" has produced a dangerous amount of misleading information. All studies of viability, e.g., phagocytic activity, DNA synthesis, etc., should be qualified, where necessary, to avoid leaving an impression of the retention of any property not directly studied.

Several laboratory tests have been suggested for the study and assay of viability

of human bone marrow. Some of the tests employed and our interpretation of them are as follow:

Motility[30]—The ability of a cell to migrate from one area to another indicates the retention of a vital property by a limited number of cell types. The observation of cytoplasmic flowing and/or nuclear rotation without motility is a general physiological process peculiar to most viable cells, but exaggerated flowing and/or rotation may be indicative of the terminal phase of the life of the cell.

Transformation[17]—When viable cells of a bone marrow suspension are subjected to tissue culture technics for a prolonged period of time, usually in excess of 14 days, they may change their morphology to assume either an elongated terminally cohesive structure or a sheet of both terminally and laterally cohesive cells. Such change is an indicator of viability; however, this may be a specific property of only a small number of cell types. The term "transformation" is used without implying any association with the genetic term.

Mitotic figures[31]—By the incorporation of a mitotic poison, such as colchicine, cells which are attempting to undergo mitosis are arrested when the chromosomes are divided at or near the equatorial plate. Such a test is not a definite criterion for cell survival because the freezing process, which may be lethal, could possibly preserve the morphology of mitotic cells.

Enzymatic activity[32]—The addition of certain hydrogen acceptors, i.e., methylene blue and tetrazolium compounds, to intracellular dehydrogenase systems results in a detectable color change of the additive if the appropriate enzyme system is active. Methylene blue is bleached to colorless leuco-methylene blue, and the various tetrazolium compounds are reduced to bright red, purplish, or blue formazans. Since the tests are based on the evaluation of a single property associated with viability, an observation of a positive result could be easily misleading. However, negative results might possibly be of significance as a means for determining nonviability.

C14 formate uptake[33]—The use of labelled formate as a test for viability is based on the following premise: Since the DNA of mature cells is essentially constant, the total quantity of DNA in an aliquot of tissue is an important measure of cell numbers. An increase in the quantity of DNA, as determined by the test, is a measure of mitotic activity. This may be determined by measuring the formate incorporated into DNA via thymine before and after freezing and thawing, and calculating the change in the number of cells capable of going through the vital process of division. The specificity of the test is increased by chromatographic separation of the pyrimidine base prior to counting.

Tritiated thymidine[34, 35]—The test consists of a histoautoradiographic method for microscopically localizing intranuclear tritium emission. The test involves film exposure to radioactivity followed by development and subsequent histological staining procedures. It is based on a similar theory of pyrimidine base incorporation into DNA as described for the C14 formate test. In the interpretation of tracer studies of DNA synthesis, the data are significant only in terms of a dynamic process. The relatively short period of exposure during the intermitotic interval and the degree of contribution to the study by this interval is not resolved. A consideration should also be made of the total cell population which includes mature cells (thought to be incapable of division) since a mixed population may lead to a discrepancy in a comparative study involving another test system.

Eosin exclusion[36]—An intact membrane

of viable cells will presumably exclude eosin. The eosin is applied to the marrow sample, and the exclusion or incorporation of the dye by the cells is observed microscopically. The ratio of cells taking up and excluding eosin is determined by direct count.

The eosin exclusion test has been used by many investigators studying bone marrow preservation. Correlation of the results of this test with the recovery-promoting capacity of the marrow samples is reportedly poor.[21] Some doubt also exists regarding the significance of the eosin test when compared to the results of the C14 formate test for viability.[37] It has been our experience that some samples considered nonviable by eosin exclusion were apparently viable when tested in tissue culture as demonstrated by later transformation of certain elements into typical fibroblasts.

The controversy over the validity of the eosin test for viability is an example of the complexity of the *in vitro* assaying technics. We do not believe that a universal test system can be defined for the evaluation of viability of stored bone marrow. Rather than be misled by the results of one test, we are evaluating our stored marrow by eosin exclusion, motility, mitotic figures, and transformation in tissue culture.

Discussion

The problems associated with the future use of bone marrow for the treatment of humans exposed to whole body irradiation are numerous and ill-defined. Procurement and preservation are of paramount importance at this time. The particular stem cell and the quantity necessary to provide protectection in the lethally irradiated individual have not yet been determined.

Studies on the treatment of lethally irradiated mice suggest a minimum dose of 50,000 and an optimum dose of about 500,000 nucleated cells are necessary for the survival of these animals.[38] Popp[39] has suggested that if an extrapolation from the experimental evidence with mice is permitted, a dose of 1.05×10^{11} nucleated cells will be necessary for the treatment of the human. Therefore, large quantities of bone marrow are deemed necessary for the treatment of a number of human casualties.

When autologous marrow is not available, it will be necessary to consider homologous marrow until a more satisfactory treatment is realized. It is in this situation that the problems of the homograft must be considered.

Urso and Congdon[40] have demonstrated that 24 hour post mortem marrow, obtained from eviscerated animals cooled to +4° C., will provide 90%—30 day survival of otherwise lethally irradiated mice. Our study[41] using post-mortem bone marrow from hybrid mice demonstrated mice exposed to lethal irradiation could be successfully treated with marrow stored up to and including 48 hours in the intact animal at refrigerator temperatures. Marrow stored in this manner for more than 18 hours was only partially effective in the standard dose; however, it was 100% effective when the marrow dose was doubled.

In order to explore the possibilities of using cadaver marrow obtained at varying intervals after death, tissue culture studies on the motile elements of bone marrow were instituted using samples obtained from human post mortem procedures.[30] This study indicated that there were motile cells in marrow obtained up to and including 50 hours after death.

The previously described works offer some encouraging evidence for speculation. However, the problems of preservation, dosimetry and the immunobiologic response of the recipient to the foreign bone marrow make the use of homologous marrow remote in the immediate future.

With few exceptions,[42,43] homografts of tissue in the immunologically normal individual will not survive for extended periods of time. Bone marrow does not enjoy this

exception. However, in the lethally irradiated patient, the reticulo-endothelial system, which is presumably responsible for the homograft rejection phenomenon, is destroyed. Under this condition homografts should be tolerated.[38,44] Unfortunately, destruction of the immune mechanism of the individual results in the transplanted marrow either failing to provide a defense against disease or infection or promotes an immune response to the other tissues of the host. Thus, the only glimmer of hope we have presently lies in the use of autologous marrow maintained for brief periods in nutrient media storage. While the long term preservation and use of bone marrow remains a problem, there is a definite glow on the horizon when one considers the reported successful long term storage and use of such vital biologic entities as bull sperm,[45] human sperm,[46] human erythrocytes,[47] and ovaries.[48]

In 1912 Carrel[49] stated, "It would be very convenient for the surgeon to keep in store pieces ot skin, periosteum, bone, cartilage, blood vessels. . . . The tissue could even be sent in small refrigerators of the type of vacuum bottles to surgeons who would need them."

A half century later, this goal has been achieved.[50] However, the present and future studies must be carefully examined and evaluated if we are to cope with the problems of bone marrow procurement, storage, and transplantation facing the military and civilians today.

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Some Considerations of the Art of the Practice of Medicine*

By
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THE ART of medicine is a complex composite qualification acquired only through experience and long and intimate associations with people—the well and the sick—and their problems. It is composite because it is a mellow blending of many attributes which when fully exemplified in one person exhibit the sort of standard we as physicians would do well to emulate.

What are these attributes? Calling upon my experience with the art of medicine as practiced by those whom I admire—these attributes involve: the personal and professional approach to patients; the clinical development of the five senses; the maintenance of clinical and purely scientific aspects of the practice of medicine in their proper perspective; conservatism in therapy with special caution and critical evaluation of new forms of treatment and in this respect as an observer rather than an experimenter, and the careful use of words which after being emitted may change colors like the chameleon.[1]

These attributes are coloured favorably by the communication of principles and observations to others by writing and teaching and by association and exchange of ideas with colleagues. They are not inherited; they must be learned and for the most part they are to be learned at the bedside in quiet wards. It is possible, I suppose, to practice in noisy wards, but it will be much better and the art of medicine will be in more fertile soil if the ward is quiet during professional rounds. How many influences have we seen that reduce the standard of medicine practised in our wards, public and private? I have observed in one visual sweep of a ward four squads in operation at once: the nurses and their aids attending to their duties; the ward cleaners; the dietary personnel, and the group of physicians making rounds. Radios and television devices are silenced as the physicians move along, but unless one sets and upholds standards in this respect, these media of entertainment continue to operate fore and aft. Quiet wards are essential to optimum development of the art of medical practice. Patients are in the hospital so that their illnesses may be identified and for appropriate treatment. This purpose should not be sacrificed at the altar of entertainment.

Other influences are also at work. Scientific advances may *seem* to make a full clinical appraisal of the patient a decreasing necessity. As the pendulum swings to undue reliance on laboratory data—not always to be relied upon—we see the grip on the finer aspects of clinical medicine become more and more tenuous. It is a pity if we allow the beauty and dignity of the practice of medicine to become attached to a pendulum which never stops at the end of its swing.[2]

The high degree of fragmentation of internal medicine into specialties, though of great benefit, must be kept in its proper perspective. It, in general, focuses attention on one aspect of the patient. It is science at work, and the art usually, but not always, suffers. The number of laboratory studies increases out of all proportion to the need and in direct proportion to the number of specialists interested in various aspects of the body. Interns and, probably to a less extent, residents are prone to request every test that might have any remote connection

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with the patient's condition. This, I confess, is a practise particularly prevalent in hospitals of one or the other of the federal services. On receiving a chart that had a long list of tests done—most of them needless—a visiting chief commented quietly "and what about the serum aluminum?" On being caught in not having this spurious test done, the intern was flustered and regretted the oversight!

I am not critical of the intern. He has just passed, in his development, from the more or less exact sciences and is given personal responsibilities for patients for the first time. He has but entered the field in which it is difficult to reach conclusions, and the rules by which to proceed or interpret are inadequate. It is in such a climate that the realization comes that so much depends on individual skill and judgment. This is the beginning of the acquirement of the art of medicine.

Should we consider it a good practise in the case of a full blown thyrotoxicosis to have a protein bound iodine, a radio active iodine uptake and serum cholesterol values and circulation time done when a satisfactory test of the basal metabolic rate supports the clinical diagnosis with a value of +65 per cent? At great cost—not to the physician—the intern is confirming, on his own, that these other values, in the typical case about which we are concerned, support the initial diagnosis. But, as clinical wisdom grows, he will find that fewer studies are necessary. It might be a good plan if in requesting laboratory or other special studies, we would make two separate lists under the following headings: A. Tests clearly indicated. B. Studies done to satisfy our personal curiosity. If the latter, the omission of which involves little or no calculated risk, were omitted, think of the reduced demand on our laboratories, the brakes on unnecessary studies and the more careful clinical considerations that would ensue. These considerations all have a bearing on the art of medicine. The tendency to put laboratory data first and clinical criteria second is the reverse of what it should be. The intern comes to us steeped in the science of medicine but often woefully weak in that aspect which involves careful weighing of what can be observed and the forming of conclusions based on the use of the senses. The clinical appraisal gives a broad background about the patient and his illness, and it is upon this information that one depends in selecting the studies to be done. If the appraisal is poor, the selection of tests is likely to be poor. The same can be said of antibiotic therapy when it is not known what the infecting agent or its characteristics are.

For example, a consultant was asked to see a soldier patient who while in the European combat zone had developed a high and continuous fever. The cause was obscure and the patient was evacuated through a series of hospitals, extensive studies being done in each. When seen by the consultant, he had been hospitalized for eleven months and many hundreds of dollars worth of laboratory work had been done. Spinal punctures and bone marrow studies were included. All values were normal. Furthermore, most of the current antibiotic agents were given extensive trials without effect. With this history, the patient was presented. He was extraordinarily healthy in appearance. Significantly enough he wore a triumphant smile due probably to the fact that he knew that he had the physicians buffaloed and that on the following day he was up for a medical discharge. His pulse rate was normal. A review of the temperature chart revealed not one normal temperature reading during the eleven months. A complete physical examination revealed no abnormalities. The consultant placed a thermometer in the patient's mouth and kept the patient's face continuously in his field of vision. In three minutes the reading was 98° F. —at five minutes the same.

All subsequent temperature readings taken under the strictest supervision were normal. Malingering had been suspected and oral and rectal temperature readings had been compared, but lacking the detective's instinct—part of the art of medicine—supervision of the temperature taking pro-

cedure left something to be desired. The soldier was discharged—to full duty. Diagnosis: "Suspected" malingering!

He who practices the art of medicine at its best is likely to be more or less of a scholar. He has read extensively and probably has written and published on medical topics. With this experience he becomes keenly sensitive to poor phraseology, abbreviations and medical presentations at the bedside or in the convention hall that lack dignity.

Be on the lookout for the intern or resident who tells the patient to "lay" down or who states that the patient has been "diuresed" or that he has "merked" the patient indicating that he has given him a mercurial diuretic. A roentgenologic report which came to my attention indicated that the condition suspected could not be detected even when "the patient was Trendelenburged." These physicians may be exceedingly bright, but one suspects they have developed in an atmosphere in which this aspect of the art of medicine was not equipped with flood lights. This custom of poor expression disappears abruptly if you and I, as teachers, instruct by example and never fail, in a kindly way, to draw attention to manners of speech not becoming to our profession. I was delighted, on one occasion, to have an intern correct an error in English which I had grown accustomed to using. If this privilege of checking both ways is extended to the younger members of our profession, a sharpening and beneficial effect will result in our use of words which after all are our mental coin of exchange.

It was in the human side of Osler that his true greatness lay. His charm, wit, kindliness and irresistible sense of humor made him a friend of all—patients and colleagues. But it was his bedside teaching that probably has not been excelled. A kindly, interested consideration of the poorest ward patient gave his subjects a feeling of security. In his general observation of the patient and the meticulous physical examination, he set standards we would do well to revive. In evaluating candidates for their specialty board in internal medicine, what a treat it is to observe the occasional candidate examine a patient like a master and how sad it is to see prominent clues to the diagnosis missed by a sketchy examination. The tendency is for the science of medicine to obscure the art. If the proper perspectives are maintained, they supplement each other. One would not belittle scientific advances in medicine, but they are most fruitful if applied when the art of medicine has laid the foundation in the quest for the solution of a clinical problem.

The patient-physician relationship at its best modifies favorably the patient's fortitude in the face of adversity. This confidence is achieved by an unobtrusive spiritual intercourse between the physician with an understanding heart and the patient who is depending on him. In this vein John Brown referred to "gentleness and compassion for his suffering fellowmen without which no man need hope to be a great physician." Each of us needs to be reminded from time to time that interest in disease processes and scientific knowledge may obscure the patient as an individual—an individual with a personality and a shrewd ability to appraise his medical attendants. How careful one must be to inspire trust and confidence by the kindly consideration of the patient and especially at times when he is at low ebb and when the slightest considerations are valued far beyond their apparent worth and when lack of consideration has the opposite effect.

Osler[3] warned young physicians to hold their tongues and speak only when they really had some contribution to make. He especially advised against needless conversation with patients on medical matters. Dr. W. W. Chipman, former professor of obstetrics at McGill University, illustrated this advice in an address to a graduating class when he predicted that over 80 per cent of the class would do general practise and went on to say "If after several weeks you have had no patients, you will welcome an expectant mother offering to put her care in your hands. She may test you by saying,

'but Doctor you should know that my last baby weighed 14½ pounds.' Now your first impulse will be to put the lady straight—that there must have been some error. *But don't* —those experienced in the art of medicine would smile and say 'Most remarkable, Madam, most remarkable.' "

A few weeks ago in St. Peter's Church in Bermuda, I read from an epitaph to a physician who died January 9, 1778, and I quote:

"To the memory of George Forbes, M.D., whom living
A singular complacency of manners
Joined with many useful talents
And eminent virtues
Rendered highly estimable.

"Friendly to mankind
His endeavors to mitigate the evils of life
Which he bore himself with temper and philosophy
Were not alone confined to the Healing Art
Long exercised by him with much reputation

"But likewise exerted in composing differences
Restoring ancient friendships and promoting
Peace, harmony and mutual understanding
Among his fellow men."

My remarks and this epitaph have touched sketchily on several of the components of the Art in the Practice of Medicine, standards of which rely, more than we can tell, upon the examples set by you and by me.

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TEN RULES FOR THE SUMMER

1. Have all immunizations (polio, tetanus, etc.) brought up to date.
2. Do not overexpose yourself to the sun.
3. Do not swim in unguarded pools.
4. Avoid polluted water supplies.
5. Avoid extreme fatigue, overeating, too many cold drinks.
6. Guard against poisonous plants, insects, animals. In other words know the area through which you may travel and take the necessary precautions.
7. Be careful in your driving.
8. Have your car maintained in good mechanical condition at all times.
9. Plan reasonable trips for the time available for them.
10. Respect the rights of others.

Professional Leadership and the Federal Nursing Services*

By

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FOR a subject as often discussed by all disciplines, as frequently posed as a topic for after-dinner speeches and convention addresses, as consistently required for emphasis in curriculum content for educational activities both in military and civilian circles, *leadership* is still a concept that teases and eludes anyone who would studiously attempt to capture it and confine it to a half-hour's discussion.

Those who would think about leadership in nursing must clarify to some extent what is meant by the word *leader*. A leader exercises a role that necessitates a forward position in relation to a "follow-ship" group. The choice to lead, however, is not his, but that of the group. The group chooses whom it will follow. Leadership is a group activity and cannot exist apart from a group. When these basic premises of the meaning of leadership are violated, confusion is reflected in what is said or written. There are those who contend that every nurse must lead. There are those who decry the dearth of leadership and the rarity with which nurse leaders appear. There are some who recognize the need for an appraisal of whether or not there should be more emphasis on intelligent and creative "follow-ship." At the far extreme, some do not see a place for leaders in a democratic group and do not even recognize the need for leadership when they see it. I believe that most of us find this variety of approaches to the subject even when we are in conference with our own groups. Our task here today is not to dwell on what may be right or wrong with these various interpretations of leadership needs, but to explore some of the important considerations that must go into our choice of leaders within the Federal Nursing Services. You and I decide upon those whom we consider worthy of our following. In this way we influence the direction nursing will take, the benefits of the services our patients will receive, and the kind of guidance upon which our personnel can depend. We in nursing services are concerned with the discovery and development of leadership on three levels: the leaders of our own areas of nursing practice for which specific skills, knowledges, and attitudes are essential; the leaders of our own branch components of nursing administration, supervision, and direction; and leaders with broader and more selective attributes for the profession of nursing. It is appropriate that we should be discussing this concern for the requirements of today's leaders.

The nurses of the Federal Services comprise the largest single nursing group in the world. We serve around the world and cross more political, cultural, racial, religious, economic, and intellectual boundaries than any other group. We carry the correspondingly large responsibility for providing the caliber of professional leadership that will represent the best in nursing and the highest possible interpretation of what is meant by a free America. We are concerned about those who are leading today; we are dedicated to the job of discovering and preparing potential leaders who will be ready and worthy to be followed in tomorrow's world. Perhaps there is in the group present here another Annie Goodrich, another Lavinia Dock, a Clara Barton, an Adelaide Nutting—or a Florence Nightingale. Who can say? Perhaps many of our group

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entertain dreams of swaying not only small or large groups of their immediate associates, but even the course of nursing itself. We have many members of the Federal Nursing Services who occupy positions of stature in the profession, but there could be more. There are those who have much to say and who have said it well, but there should be many more. There are great books to be written. There is the *whole* story of nursing yet to be told. There is work to be done in defining and defending what nursing is. There are thrilling discoveries yet to be made about nursing. It would be disappointing if such high aspirations were lacking in a group such as ours.

We hear a great deal about the changing concepts of the leadership role. There are lists of criteria for the identification and differentiation of leaders in our profession today. I do not believe that the basis of leadership changes. True, what the leader of today is expected to do, the forms his leadership will take, the tools with which he works, and the very language he uses may differ. But these are only technical details that are very superficial compared to the man's need for inner vitality and the power to lead. Thomas Mann, in writing of Goethe, said "It is clear that the word is nothing but a linguistic makeshift for something that language cannot describe, for an emanation whose sources do not lie in the intellectual but in the vital."[1] Over and over this has to be said of the giants among us! This is the inner vitality that sets apart those who influence others and the world about them. It is for this that we must search.

Many of our nursing writers have joined in saying that there is a dearth of leadership in our profession. Writers in other professions say the same about theirs. Is the awareness of a dearth of leadership peculiar to our times? I wonder if it is any more correct than to say that having crises is peculiar to this generation. Or would you agree that in the rapidity with which our world is changing, we look more critically at our leaders? With the increase in our own fears and suspicions, we look searchingly for guidance, even solace, in very challenging times.

Last year we listened as Carl Sandburg talked to Congress about Lincoln. He used the two words "steel and fog" to describe the tremendous contrasts combined in the man. Since then, I have thought about these contrasts whenever leadership has been discussed. It is so much easier to define the "steel-like" qualities. We are familiar with the often-cited qualities needed for nursing leadership. These are easily enumerated strengths or skills in administration, technical know-how, education, and experiences. There must be a consciousness on our part at all times that the word manager, administrator, or educator is not synonymous with the word leader. Their strengths are important, but there are "fog-like" qualities that must be interwoven with them if such experts can ever rise to become leaders of nursing. Today, we are going to examine only a few of those qualities that nursing demands of leaders who function in today's world.

The quality of *selflessness* in leaders is not in the old context of the repudiation of self, but rather in the ability and the willingness to work through others. It has been said that we could unleash limitless possibilities by not worrying about who gets the credit. There must be the connatation in selflessness of a leader's being adaptable to serving as both the agent and the object of change. Mildred Newton, in an article in *Nursing Outlook* on developing leaders, expressed poignantly the joy that can come from this kind of leadership "in seeing those whom you have led surpass you in ability and achievement."[2] The identification of potential leaders and the in-service education efforts necessary to effect their development are experiences in which every nursing service administrator can share and find joy. Whenever we see someone who has used himself as an instrument for another's growth, we have an example of dynamic selflessness in action. This is true especially if it has been done without hesitancy, even when the position of the leader and the

status quo situation may have been threatened. Such leaders must be dedicated to greater objectives than those which serve their own selfish ends.

Being human has ceased to be a quality that is allowed begrudgingly to nurses. It is expected of all nurses and demanded of leaders today. The *person* must show through—a person who can have feelings with others, who can give and receive affection, and who can exercise with wisdom the rights of being human. Leaders have desires and need satisfactions the same as the rest of us. They must be willing to let others get close enough to share in the happenings that matter to them and to expect the same kind of understanding of needs that characterizes the response of one human being to another. Denial of the person—the hiding of self behind the cloak of a titled office, a stiffly starched white uniform, or a pair of leaves on a shoulder—is no longer tolerable. A leader knows the difference between being human and being weak, senses the difference between comradeship and familiarity, and relaxes in the confidence that greatness is more clearly evident to others when viewed in contrast and in coexistence with that which remains human. He also knows that the most potent force he can bring into any situation and the tool he must be most skilled in using is himself as a person.

The ones to whom we trust the direction of our profession must reflect in their leadership the philosophy of nursing as a *professional discipline.* Each one of us has the personal responsibility to scrutinize with the greatest care the philosophies of the spokesmen for our own groups before we do them the honor of listening to them or give credence to what is said by repeating it. Listen carefully for that breadth and depth of the meaning of our work with patients that Dorothy Johnson has described as "a service which offers comfort, gratification, and assistance at those times when individuals are under stress, and in relation to their basic human needs."[3] Sometimes, we may feel that within our own groups is the greatest struggle to have nurses occupy themselves with more than the dependent function of nursing, but this is the struggle of all nursing. True, we have our share of procedure-oriented practitioners, but we must continue to interpret a concept of nursing that will put the ministrative role of nursing in its proper perspective and will make every activity person-centered rather than task-centered. When this concept is understood fully, when each nurse can use this concept in daily practice, there will no longer be the fears and frustrations that some nurses have expressed regarding the replacement of professional nurses by other groups and the loss of their prerogatives for the nursing plan of care for the patient and his family. Margaret Mead has reassured us of the continuing need for the kind of services we believe to be the core of nursing. She helps us to realize that ours can never be a routine service when she says:

> You stand between all those who are vulnerable and the possibility that the community may forget them, may not care for them, may not give them enough rest, may not let them go to bed when they ought to go to bed, may not provide them with a shoulder to weep on, or a place to rest. The need for this function of protecting the vulnerable is one that will never disappear. There is no possibility of a human society where it will not always exist.[4]

This is the meaning of nursing practice that the leaders of our services must interpret in whatever setting they may find themselves —whether it be on the peaceful home front, in disaster areas anywhere in the world, in military communities, or on the world front of safeguarding public health.

The leader in a world profession must be a *world citizen.* Would you deny that nursing is a world profession when the members of our own services are spread throughout the globe? This citizenship must be based on a many-faceted awareness of the role of the profession in today's world. This citizenship carries responsibilities for action, but first of all, let us be sure that nursing is able to look at the world with vision that is not blurred by old prejudices and preoccupied with provincial aims. We must direct this question to the educators of the profession.

If the Federal Nursing Services demand this world citizenship role of their leaders, then we must examine carefully all education. Before our leaders can take up their duties, it may be necessary that they submit to re-education against provincialism. As Norman Cousins describes in his book, *Who Speaks for Man?*, it has happened to others. He states that his conventional education had prepared him for a "bird's eye view of the world." It had taught him to recognize the things that differentiate, but it had failed to teach him that the principal significance of such differences is that they are largely without significance.[5] The professional curriculum of today must center about the most important central fact of our time—that the human community is one. With the right use of present-day miracles in transportation and communications, there will be even more dramatic opportunities for stimulating interchange within this community and with an ever-widening group of associates. Here again, I wonder if we are ready to make the fullest possible use of this as a profession. Are you conscious of our difficulties in communicating even within our own groups? How do we stand as we look at our leadership's ability to interchange outside our profession? Are our own nurses equipped for interchange outside our own political boundaries? How well are nurses prepared to converse with the rest of the world? The next century may plunge us into space before we are comfortable on our own planet. These are questions that we cannot postpone. The impact of these miracles on our profession cannot be ignored, lest 21st century nurses curse us.

This world citizenship responsibility for nursing has special significance in the realm of action for world health. Two years ago Canon Charles E. Raven of the British Royal College of Chaplains spoke with an American medical audience in Cincinnati on this role of the health professions. He gave some pertinent advice regarding the need for a marriage between the health professions and sociology in order that an individual may be dealt with always in relation to other persons and in relation to his or her environment. Further, he emphasized that medical personnel are *the people* and that *we* must see that the standard of corporate life is raised along with the standard of personal life. He expressed the belief that "we ought to be as prepared to look at the corporate madnesses and diseases of our time as searchingly and with as deep a sense of responsibility as we do the individual defects."[6] Nursing must join with the other healing and helping professions in working for corporate health. The enlarging concepts of the nurse in the world community must have its roots in the basic preparation of all the members of our profession.

The Federal Nursing Services stand today in the unique position of being able to influence all trends in professional nursing education toward giving the nurse better equipment to deal with the problems in the world in which she works. We have a need *now* for the kind of leadership that would justify any far-reaching changes that schools of nursing throughout the country would want to make in order to prepare their graduates for world citizenship. Our standards, our expectations of our staffs, and the performance levels of our services are going steadily upwards. This must continue. This can continue if our leaders are not culturally deficient and professionally inhibited. A broadening liberal education, sound studies in the behavioral sciences, and the evolution of a personal philosophy about our democratic faith are essentials for those who will lead nursing in this century and the next. These essentials will enable them to be at home working in the world of ideas—a world that is divided into two ideological camps. It is no longer enough to say with glib tongue that we believe in a democratic way of life. Unlike the waiter, who, when asked the difference between the one dollar dinner and the two dollar dinner, replied, "One dollar," we must be able to defend our ideas and to discuss with conviction those beliefs that, prior to this time, have not been challenged. Our leaders must be well-enough informed to take this faith

in man and to expand it, to improve it, and to make it achieve ultimately freedom for all. Because of this, we have a stake in what is happening in education for an organization society such as described by William H. Whyte in *The Organization Man.* We must be concerned with what is happening to the humanities and the fundamental disciplines. The professional leader needs the kind of foundation that will give "some sense of where we came from, so that he can judge where he is, and where he is going and why."[7]

And so, some must lead today and must answer for the kind of leadership we will have tomorrow. There is a consciousness of the seriousness of this charge reflected in the writings by the leaders of nursing. What are they saying? In essence, I think we are agreed that nursing must demand of its leadership a *sensitiveness* that must go deeper and extend boundaries far beyond those ever known before. This sensitiveness must be in terms of the needs, moods, and aspirations of one world. We in nursing would follow those with such sensitiveness. We must choose to follow those who are keenly aware of all the forces that bear upon the profession's services to this world. Some of us may at times feel impatience toward the truly great leaders when it seems that they are picking the way so painstakingly. Our leaders must, after each step, perceive the slightest change *that* step has made in all relationships before they step again. This must continue to be true. Exercising the kind of leadership based on being attuned to one's world is a thing of skill and beauty. This is what we demand of leadership.

I attempted to draw a comparison between the manner in which most of us exert leadership and the way of this sensitiveness that we have been talking about. The most descriptive and possibly the closest analogy that I could think of was the picture of an armored tank plunging through a forest as compared to that of an Indian scout on moccasined feet finding his way through a like forest.

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Experiences with Hypnosis on a Surgical Service*

By

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INTRODUCTION

THE value of hypnosis as a diagnostic and therapeutic agent is well established with ample confirmatory clinical experience in some fields. However, reports from a surgical service are few, the use of hypnosis in surgery remains as almost an isolated instance here and there, and the results are not well disseminated. Furthermore, hypnosis continues to be regarded as an esoteric practice with nefarious connotations. For these reasons our moderate experience is reported. Because of the emotional appeal of hypnosis to curiosity seekers, because of the fear of hypnosis by uninformed persons and because of the real possibility of doing harm by the ill-advised use of hypnosis, before beginning its use, certain quite rigid restrictions were laid down. These are as follows:

1. In no case is hypnosis to be used without express knowledge and permission from the Chief of Service.
2. In all cases a brief, pertinent psychiatric history is recorded and in case of any doubtful positive findings, psychiatric consultation is obtained before hypnosis is attempted.
3. In all cases an adequate record is kept, contained data on reasons for use, method employed, suggestions given and results attained.
4. Use of hypnosis is limited to symptom removal except in one instance where surgical anesthesia was induced. Depth is limited to that needed for post-hypnotic suggestion and no attempts at psychoanalysis or character modification are made.
5. Only the three authors of this report have been allowed to use hypnosis and then only under the above restrictions.
6. All patients were on an in-patient status and in each case there was full preliminary discussion with complete agreement by the patient or parent. The hypnotist was the operating surgeon or ward physician in each case, thus strengthening the doctor-patient relationship. Patients were not frightened by the term "hypnosis" but rather "relaxation" was spoken of as the desired result.

We alone are responsible for our results and this method is not necessarily standard treatment in the Army hospitals.

KNEE CASE SERIES

In an effort to reduce anxiety prior to a surgical procedure, alleviate post-operative pain and hasten rehabilitation, hypnosis was used in a consecutive series of nine male patients undergoing uncomplicated arthrotomy of the knee for one or more of the following conditions: tears of the menisci, chondromalacia and chronic synovitis. Ligamentous tears were excluded. In evaluating our results this group was contrasted with the preceding 40 consecutive male patients undergoing uncomplicated arthrotomy for similar afflictions of the knee. The only difference between the control and experimental groups was the use of hypnosis.

The first patient was hypnotized on four consecutive days prior to surgery with a total time expenditure of 70 minutes. Thereafter, hypnosis was accomplished only once on the day prior to surgery for an average

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time expenditure of 30 minutes. Post-operative hypnosis was utilized on two occasions, for reinforcement in one instance and anesthesia for arthrocentesis in another.

Induction was successful in the nine cases reported. Hypnosis was attempted in a tenth patient, but induction was not successful. In each instance the following post-hypnotic suggestions were given:

1. The patient will not fear the operation and will have a full night's sleep on the evening prior to surgery.
2. He will be aware of the inevitable post-operative pain in the affected knee, but the pain will not bother him.
3. He will be able to exercise the operated knee immediately after surgery and lift weights without discomfort soon after removal of the skin sutures.

No yardstick existed to measure anxiety prior to operation; indeed, this factor was not mentioned in the control group. Consequently, no comparison could be made. However, it was noted that those in the hypnotized group did sleep soundly on the night prior to surgery without exception and in the latter part of the series without benefit of sedation. This observation was made by nursing service personnel who did not know of the use of hypnosis.

In evaluating post-operative pain, we felt that the only objective criterion for comparison was the total post-operative dose of analgesia. All analgesics were converted to milligrams of demerol since this was by far the most common drug employed. One hundred milligrams of demerol was arbitrarily made equivalent to ¼ grain of morphine or 2 grains of codeine. Any error in this regard was felt to be constant. As seen in Table 1, in 20 patients of the control group where detailed records were available, the average post-operative dose of analgesia was 360 milligrams of demerol as opposed to 275 milligrams of demerol in the experimental group. Closer analysis revealed that all patients required narcotics in the control group, two patients necessitating only one dose with a maximum dose of 800 milligrams. In the hypnosis group one patient did not require analgesia at all, and two others received only one dose. The first patient in the series required 700 milligrams of demerol. He had been given the post-hypnotic suggestion that there would be absolutely no post-operative pain. Thereafter, we gave the suggestion that the patient would be aware of pain but that it would not bother him. This met with greater success. Indeed, most did state that they noticed pain but would refuse medication because they were not aggravated by the discomfort. If this first case is deleted, the average narcotic dose in the experimental group is lowered to 220 milligrams of demerol.

TABLE 1

Average Dose of Post-operative Analgesia:

Control Group	360 mg. of demerol
Experimental Group	275 mg. of demerol

The criteria we have used for comparing rehabilitation time require a few introductory remarks. At Tripler Army Hospital, we deal with members of all the uniformed services, most of whom are engaged in physical labor. Because of this, most commanders are unwilling to accept a man on discharge from the hospital unless he is ready for full duty, or will be following a few weeks of limited duty.

In an attempt to bring the patient to this position in the shortest possible length of time, the Physical Medicine Service works in close harmony with the surgeon. From the moment the patient reacts from anesthesia, he is started on quadricep setting exercises and straight leg raising, progressing through static weight lifting and progressive resistive exercise with a weighted boot. Realizing that each case must be individualized, long experience, however, has taught the Orthopedic Service that the least amount of complications and readmissions occur when the following criteria are met prior to discharge from the hospital.

1. Absence of effusion.
2. Absence of a limp.

3. The patient can fully extend the knee ten consecutive times with a 30-pound weighted boot.

Making use of the number of the post-operative day on which the patient could first meet these criteria the comparison was made. As seen in Table 2 the average rehabilitation time in the control group was 46 days with a low of 21 days and a high of 85 days. The average time in the experimental group was 27 days with a high of 40 days and a low of 17 days. This represents a saving of 19 days or almost three weeks. In addition, all patients but one were capable of straight leg raising on the afternoon of surgery, a feat infrequently seen in the control group.

TABLE 2

Average Rehabilitation Time:	
Control Group	46 days
Experimental Group	27 days

In the experimental group, one patient was lost to follow-up because of emergency transfer. Of the remaining eight, two had mild effusions several weeks following discharge, both of which responded to limited activity within several days. One patient did well until he sustained a valgus twist to the same knee several months following discharge. at the present time he is being treated conservatively as an out-patient for a strain of the medial collateral ligament. Thus, short-term follow-up does not indicate that chronic or recurrent problems have been seen following earlier discharge from supervised care.

CONCLUSIONS

1. Hypnosis was employed with ease and with no undue loss of doctor-time.
2. There were no untoward results in any respect.
3. Hypnosis proved to be a good investment from the aspect of hospital days saved.
4. Reduction in awareness of pain post-operatively allowed a significant reduction in narcotic utilization.
5. It is stated that a strong doctor-patient relationship will permit these same results and this is not denied. Improvement by whatever name, still is improvement.

GENERAL SURGICAL CASE REPORTS

Unfortunately, the general surgical cases are less comparable and make up a less homogeneous group so that case histories rather than figures must be presented. Thus, the end-point tends to be a little less clear.

Case 1. A 41-year-old white male with chronic alcoholism and severe chronic pancreatitis was hospitalized following an acute exacerbation of pancreatitis. During this hospitalization he had become addicted to demerol, which he was requiring every three hours for the relief of pain. A total pancreatectomy was performed, following which the patient had a severe anxiety reaction with inability to sleep. He also complained of severe pain and loss of appetite for food and liquids.

"Help in relaxation" was offered the patient and he readily agreed to this as his insight was quite good. During the first session, the patient cooperated very well and a moderately deep plane of hypnosis was obtained although a catatonic state was not attempted. He was given the post-hypnotic suggestions of pain relief, ability to sleep that night and the stimulation of appetite. Subsequent sessions were equally satisfactory, progressively easier and more effective. A deep trance could be obtained within 30 seconds after the initial session. After the first session he slept well, complained less of pain and at each meal cleaned his food tray.

His post-operative course was further complicated by a biliary cutaneous fistula which failed to respond to conservative surgical treatment. A Stamm-type gastros-

tomy then was performed without the aid of pre-operative medication, general or local anesthesia but simply by using a deep hypnotic trance. The procedure was tolerated very well although sensation in the skin was present at times. The procedure lasted 20 minutes, during which time the patient maintained a deep trance. No post-operative medication for pain was used.

This patient later underwent an operative closure of the biliary fistula. Pre-operative sedation was found unnecessary, as was the use of post-operative narcotics. In the post-operative course, nothing stronger than an occasional Darvon R compound was used. Hypnotic trances with post-hypnotic suggestions were used daily for five days and then found unnecessary.

Positive results in this case, then, were relief of pain and anxiety, stimulation of sleep and hunger, induction of surgical anesthesia and ablation of need for pre- and post-operative medications for pain. This man has regained normal weight and has gone to work.

Case 2. A 7-year-old white male, born with a tracheo-esophageal fistula, had repair shortly after birth. He subsequently developed a stenosis of the esophagus at the anastomotic site which had required repeated dilatations. A thoracotomy with revision of the esophageal anastomosis was carried out, following which a leakage into the pleural space occurred. This child required several closed thoracotomies and other relatively painful procedures. He also showed signs of progressive weakness and weight loss due to his lack of appetite.

Hypnosis was first used as a means of allowing the boy to relax and to stimulate his appetite. Induction of the trance was done easily by having him imagine television programs of his choice. Subsequent sessions were easily started in the same way. A satisfactory deep trance with skin anesthesia and catatonia was obtained during the second and subsequent sessions. The nursing staff on the ward definitely noted a change in his behavior and in his appetite although all were unaware of the post-hypnotic suggestions made. Positive results here were pain relief, acceptance of manipulative procedures with the thoracotomy tube, ablation of anxiety and stimulation of a good appetite.

Case 3. A 39-year-old Caucasian male underwent excision of a large keloid on the dorsum of the left hand with primary split thickness grafting on 1 July 1960. The initial two dressing changes were performed under hypnotic anesthesia with complete success. The patient had been complaining of pain in the donor site on the right hip and a post-hypnotic suggestion to relieve this pain was given with complete success at the time of the second dressing change. Use of hypnosis for painful dressing change is well known and is exemplified here.

Case 4. A 33-year-old white female was admitted with severe regional ileitis and colitis, complicated by rectovaginal fistula. She had been seen by our psychiatric department because of severe anxiety and fear of an operative procedure. At the time of admission, she would cry spontaneously, had been troubled with insomnia and was very fearful of surgery.

"Relaxation" was suggested to her and was readily accepted. During the first session, a light trance was obtained but with this as a background in allaying certain fears she might have had, a deep trance was obtained in subsequent sessions. Post-hypnotic suggestions made were primarily for the relief of fears from the operation, ease in relaxing and in sleeping. This patient needed rather frequent reinforcement of these post-hypnotic suggestions at first, but later appeared quite relaxed and calm during the remainder of her post-operative hospitalization. The relief from pain was not attempted in this patient. Positive re-

sults attained here consist of ablation of general anxiety and fear of operation, relief of fear of intravenous injections, relief of dread of the recovery ward, relief of insomnia and increase in appetite.

Case 5. A 50-year-old Hawaiian male had had a 90 per cent subtotal gastrectomy performed at another hospital for chronic duodenal ulcer complications. A revision of the stoma was carried out along with a plastic procedure to enlarge the gastric pouch. Following surgery he had functional spasm at the anastomosis with complaints of fullness following meals, relieved only by vomiting. Various medications including tranquilizers, smooth muscle relaxants and a period of gastric decompression were of no assistance. Hypnosis was used to relieve the feeling of fullness and to prevent the delayed emptying of the stomach. Three therapeutic sessions were carried out with a satisfactory response to these post-hypnotic suggestions. A definite relief from these distressing symptoms occurred and the patient's subsequent course was entirely satisfactory.

Case 6. A 61-year-old white male entered this hospital with pain, weight loss and obstructive jaundice. At laparotomy, a carcinoma of the pancreas was found with widespread peritoneal and liver metastasis. Hypnosis was attempted in the post-operative period in an attempt to relieve pain. A light trance was obtained but apparently due to lack of concentrating abilities or fear, a deeper trance could not be obtained. When sufficient sedatives or narcotics were used to allay pain, the patient was unable to obtain any state deeper than a light trance with muscle relaxation and light sleep. Hypnosis was unsatisfactory from the relief of pain in this patient. Failure here was our fault in that we allowed the patient to progress to the point that pain was so constant and severe that we could not command his attention. However, the pain of pancreatitis is a severe challenge to hypnosis even at best.

Case 7. A 44-year-old white female had vague abdominal complaints, weight loss and severe non-specific anxiety. She was seen by the psychiatric department prior to our attempt at hypnosis as a method of preoperative "calming" and for the relief of pain. This patient had several hysterical episodes during hospitalization and at one point, quite aggressively refused to allow a member of the medical staff to attend her. Attempts at hypnosis failed in this patient as at no time was even a light trance obtained despite the patient's apparent efforts to cooperate. Here, again, the fault is ours because this patient had sufficiently severe psychiatric troubles to be automatically excluded from our attempts. Our attempt to fit the patient to the method failed.

Case 8. A 43-year-old male entered the hospital with chronic alcoholism, pancreatitis and narcotic addiction. Hypnosis was attempted in the effort to relieve pain by other than narcotics, but was of no value here. The patient was unable to obtain a light trance despite several attempts and a variety of methods. Here, again, our criteria should have eliminated this patient because drug addiction and pancreatitis make an almost unbeatable combination which hypnosis will not touch.

Case 9. A 25-year-old female was seen because of chronic unrelenting pruritis ani and which had not responded to a variety of conservative measures. Hypnosis was attempted but a trance could not be obtained despite several attempts and methods. This patient should have been a good candidate and should have had a good result. Insufficient time was expended before hypnosis was declared a failure and a surgical cure was attempted. This subsequently failed and the patient once more becomes a good candidate for hypnotic relief.

Discussion

Our experience with hypnosis as an adjunct to surgical treatment has been quite

rewarding. While not a large series, the individual successful cases demonstrate the usefulness of this method. In selected cases, hypnosis can be of immeasurable value in the relief of pain, anxiety and of certain associated post-operative symptoms.

Hypnosis has been used in the surgical specialties as reported by Werbel, Tinterow, Leslie and others. We have confirmed their observations that this technique can be of great aid in the relief of pain and in smoothing out an otherwise uncomfortable post-operative period. Our experimental group following arthrotomy demonstrates the shortening of recovery period and lessening of the need for post-operative analgesics in the hypnotized patients. In our individual cases the results in the first five speak for themselves. In a poor-risk patient, a general anesthetic and heavy pre-operative sedation were obviated by the use of hypnosis.

The last four cases are classified as failures in that a trance of an effective depth could not be obtained. Tinterow also showed that patients already addicted to narcotics were poor candidates for this method and we have two such patients in this latter group. Post-hypnotic suggestions were satisfactorily carried out in all cases where a deep trance could be obtained.

Barber has emphasized that hypnotic analgesia requires the patient's confidence in the physician, that hypnosis can relieve the type of pain, and that the patient must be made inattentive to the painful stimulus. We have found that the patient can be made analgesic during a trance but complete analgesia is difficult to obtain by post-hypnotic suggestion. We have routinely given these patients the suggestion that pain may be present but not bothersome and that drugs for the relief of pain will be available if necessary.

An experienced and specially trained hypnotist has not been necessary and, as a matter of fact, the interpersonal relationship between patient and surgeon has been of help in establishing a hypnotic trance in these patients. As Rosen and Pleune have shown, this is a psychologic technique based on an interpersonal relationship between two individuals. Our aims have been carefully limited to the surgical problems and we have not found it advisable to use hypnosis for relief of unassociated symptoms, habits or character traits.

The time expenditure required of the surgeon is worthy of some note in this field. We have found that our initial session often lasted 40 to 45 minutes; however, subsequent reinforcement periods were much shorter. This seems a justifiable exchange for an average of 19 days' shortening of a period of recovery as noted in our series. Hypnosis will naturally be of most value in chronic cases wherein repeated procedures associated with unpleasant symptoms of pain will be associated.

As Kroger has shown, hypnosis should not be used as a substitute for anesthesia but as an adjunctive measure to relieve unpleasant side-effects or anxiety. Hypnosis is limited by the patient's desires or cooperativeness and is contraindicated in the severely neurotic or psychotic individual. Age is of little limitation if attentiveness is possible, our youngest patient being seven years old. Patients addicted to narcotics or in severe distress, as from widespread metastases, are poor candidates because of their inattentiveness.

Summary

1. Hypnosis has been of great value as an adjunct to surgical treatment. The technique has been used to decrease post-operative pain and weakness, to allay fears and anxieties, to stimulate appetite, control nausea and vomiting, allay insomonia and as a method of anesthesia.
2. The hypnosis was carried out by the operating surgeon or the surgeon in charge of the post-operative course in each case. The natural patient-doctor relationship acts as an excellent basis for hypnosis.
3. Specific problems related to the surgical disease were concentrated upon. These

limitations are worthwhile in assuring that no harm will be done.

4. Post-hypnotic suggestions for anesthesia were generally not successful. Inattentiveness to pain seems a more effective and realistic suggestion.
5. The time expenditure required by the surgeon is not excessive when compared to the value realized.

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ABSTRACT: Chronic Urticaria Due to Mould Hypersensitivity: A Study in Cross-Sensitization and Autoerythrocyte Sensitization.* By Walter B. Shelley, M.D. and Ralph Florence, M.D. (For original article see AMA *Archives of Dermatology,* April 1961.)

Studies were made on a patient with severe chronic urticaria and an associated fungous infection of his palms and soles. On skin testing, he was found to have an exquisite hypersensitivity to fungal antigens. Dilutions of 1-1,000,000 of extracts of Trichophyton rubrum, or of Aspergillus flavus, produced urticaria when given intradermally. Even patch tests with the Aspergillus flavus extract (10^{-3}) produced an urticarial reaction locally. Clinical flares were proven to follow exposure to airborne saprophytic fungi.

It was possible to track the route of absorption of the inhalant fungal allergens to the blood since the intradermal injection of the patient's own blood produced urticaria. Fractionation of the blood indicated that this urticarial response was associated exclusively with the red cells. Other fractions gave negative responses. Thus, this patient was viewed as having a form of acquired autoerythrocyte sensitization which apparently resulted from mould antigen adsorption onto the red cell.

* This study was conducted under the sponsorship of the Commission on Cutaneous Diseases of the Armed Forces Epidemiological Board and was supported by the Office of the Surgeon General, Department of the Army.

A New Plating Medium for Rapid Disc Sensitivity Tests

By

LIEUTENANT COLONEL ALEXANDER KIMLER, MSC, *U. S. Army Reserve**

The antibiotic sensitivity of bacterial pathogens may be read in 2 to 6 hours. By using a new medium on which the clinical isolates tested grew rapidly and by incorporating in it a tetrazolium salt, the time lapse between isolation and laboratory report was reduced considerably.

INTRODUCTION

THE IMPORTANCE of rapid sensitivity readings lies in the earlier application of specific chemotherapy. As generally practiced, the results of disc tests are reported within 16 to 24 hours. This time interval is necessitated by a combination of factors inherent both in the methods currently applied and in the rate of multiplication of the bacteria involved.

Color changes in sensitive indicator systems have been used as a means of reducing these reading times. Mitchell[1] overlayered blood agar plates and noted the contrast between the areas of oxygenated and reduced hemoglobin. A similar overlayering method, using resazurin under oil, was published by Pital, Disque and Leise.[2]

The new medium to be described is relatively simple in its preparation. In addition, it is used with a technique in which a minimum of time is invested. On it, the sensitivity tests may be read in 2 to 6 hours, depending on the generation rate of the organism involved.

MATERIALS AND METHODS

The basic medium used was tryptose agar with thiamine (Difco). Forty-one grams were added to 870 ml. of distilled water, the pH was adjusted to 7.2, and this was sterilized according to the package directions. After cooling to 45°-50° C., the following solutions were added aseptically:

100 ml. of 10% d-mannitol (Difco), Seitz filtered, final concentration 1%,

20 ml. of Dubos Oleic Serum Mixture (Difco), final concentration 2%,

10 ml. of a 1:350 dilution of triphenyltetrazolium chloride (Nutritional Biochemicals Corporation), previously autoclaved for sterility, final concentration 1:35,000.

Plates were poured and used any time after hardening.

Initially, two control media were used. These were Mueller-Hinton (Difco) and tryptose agar with thiamine. The former was discontinued when it was found to offer no advantage over the latter.

The following organisms were streaked heavily on both media:

Staphylococcus aureus—50 strains
Staphylococcus epidermidis—50 strains
Diplococcus pneumoniae—5 strains
Beta Streptococcus—2 strains
Proteus species—10 strains
Pseudomonas species—10 strains
Escherichia species—10 strains
Klebsiella-Aerobacter species—10 strains

Sensitivity discs were applied with a BBL (Baltimore Biological Laboratory) dispenser. Four antibiotics were used, each in 2 different concentrations. These were:

Penicillin—2 and 10 units/ml.
Erythromycin—2 and 15 mcg./ml.
Chloromycetin—5 and 30 mcg./ml.
Tetracycline—5 and 30 mcg./ml.

All plates were incubated immediately at 37° C., and read macroscopically at ½ hour intervals up to 6 hours.

RESULTS

Results were valid only when the control medium and the test medium showed the

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same antibiogram, with similar zones of inhibition when present.

Table 1 presents the averaged elapsed reading times for each group of organisms on both media.

TABLE 1

AVERAGE MINIMUM ELAPSED TIMES FOR VALID SENSITIVITY READINGS

Organism	Control Medium (hrs.)	Test Medium (hrs.)
50 Staphylococcus aureus	2½	2
50 Staphylococcus epidermidis	3	2½
5 Diplococcus pneumoniae	6	5½
2 Beta Streptococcus	6	5½
10 Proteus species	3	3
10 Pseudomonas species	3	3
10 Escherichia species	3	3
10 Klebsiella-Aerobacter species	3	3

DISCUSSION

Most of the test organisms grew somewhat more rapidly on the test medium, trypotse agar with thiamine as modified above. This permitted earlier visualization of the zones of inhibition. Frequently, not always, the readings were made easier by the appearance of color in the reduced tetrazolium salt. This took place wherever the organism was growing outside the inhibitory range of the antibiotic. In each case, further incubation up to 24 hours showed no change in the sensitivity pattern. However, the intensity of color was often increased considerably.

SUMMARY

Antibiotic sensitivity tests of common bacterial pathogens are performed in 2 to 6 hours on a relatively simple medium. This medium speeds the growth and usually changes the color of the organisms. Critical evaluation of zones of inhibition was possible within a maximum of 6 hours for all organisms that were tested.

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Is Your Hospital's Attitude Showing?

By

MAJOR LEONARD BERLOW, USAF, MSC*

AND

BRIG. GENERAL J. W. HUMPHREYS, JR., USAF, MC†

(With one illustration)

CIVILIAN hospitals must rely on good public relations for their existence. They are in competition with each other and rely on "customers"—just as surely as do competing super-markets. *Selling* themselves to the community has been the job of public relations. For, after all, most hospitals do belong to the public being supported by their taxes, fund drives and endowments.

Hospitals have traded the "place to die" reputation for one as a place to live! More and more people are exposed to hospital experiences as patients, visitors and volunteer workers. Everyday newspapers and magazines publicize hospitals. There is a sincere public interest in what goes on inside hospitals. Boards of governors and administrators place a great deal of reliance on what attitudes people have about their hospitals. It can make or break a hospital.

A hospital cannot operate for the convenience of its staff. A poor hospital attitude is clearly evident the moment patients take a secondary role.

Periodic inspections by higher headquarters point up many discrepancies. Emphasis is placed on correct reports and procedures consistent with "current manuals and directives." Hospital attitudes may be overlooked. Granted, it is difficult to investigate what the people who use service hospitals really *think* of these facilities, but it is possible to *sense* how they feel. Every person working in a hospital *knows* whether or not his hospital is doing as much as it can to improve its attitude toward patients.

The dictionary defines attitude as "a state of mind." If a hospital's attitude is patient oriented, then good public relations will result. There have been many examples of this at the USAF Hospital Wright-Patterson. The only thing unique about these ideas is that they are actively in effect and have improved public relations!

In spite of criticism, and perhaps a feeling of inconvenience for the staff, unrestricted visiting hours from 10 a.m. to 9 p.m. were instituted throughout most areas of the hospital, the exception being obstetrics, closed psychiatry and pediatrics. We found that patients and their visitors liked this change. In a short time nurses and doctors found that it really wasn't as bad as they thought. Now, no one gives it a second thought and everyone seems well pleased.

Since this worked so well, why not allow children visitors too? It was worth a try. Now children visit except in the areas shown above. Dads and Moms are so thankful that they can see their children. It makes for a more pleasant hospital stay.

There have been some abuses of both these liberalized visiting policies. But with a little patience and understanding all "situations" have been worked out satisfactorily. These are amazing ways to assist public relations. Noteworthy also is the fact that there has been no increase in wound infections as predicted by a number of observers prior to these changes in visiting.

We have found that it pays to advertise! Our relationship with the public we serve

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From U. S. Air Force Hospital Wright-Patterson, Wright-Patterson Air Force Base, Ohio.

* Major Berlow is now assigned to Whiteman Air Force Base, Mo.

† General Humphreys is now Commander of the U. S. Air Force Hospital Lackland, Lackland Air Force Base, Texas.

FIG. 1. Sections of pages from the booklet "Meet Your Wright-Patterson Medical Facilities."

has improved because we tell the story of our base medical services at every available opportunity. Sometimes this story is not particularly pleasant, but taking people into our confidence has paid off. A case in point occurred last summer when 26 medical officers were lost through transfer and expiration of service commitments. Replacements were not available for a period of several months. So, it was obvious that during this critical period, medical care—especially in our outpatient facilities—must be greatly curtailed. Patients would be seen by appointment only.

The facts were immediately presented to every available person by means of talks to personnel during Commander's Calls, Women's Club gatherings, hand-outs and articles in city newspapers. It was no simple matter to inform an estimated 30,000 people including military and their families and civil service workers! Evidently there was complete understanding because everyone cooperated and little or no difficulty was encountered.

The publication of several booklets has done a great deal to make friends for our hospital. "Meet Your Wright-Patterson Medical Facilities" is sent or given to each incoming military person (Fig. 1). Its 15 pages tells about what medical services are offered, and how they and their families may avail themselves of these services. Cartoons help make sure the booklet is read. It must be, for we've found that our patients are following it implicity. It has helped both of us.

Then upon admission, our patients get the feeling they're welcome when, at the Admission Section, we give "This Is Your Hospital." This booklet gives patients hospital information and rules and regulations in a pleasant way.

Kids get special consideration when they are to be a patient at Wright-Patterson. "Going To The Hospital" is a book especially for them. It tells children what to expect when they come to us as patients. Included with the book is a box of crayons so they can color the cartoon pictures.

Not all service hospitals are fortunate enough to have printing sources available. There are still numerous other ways to serve public relations purposes. We have found that our base newspaper is anxious for stories relating to the Base Medical Services—and we're just as anxious to use this means to tell our story. So, every week we have a full length article about what we are doing.

A little thing like signs mean a lot. There should be plenty of well placed directional signs to assist patients and visitors. These can (or cannot) be a source of good public relations. Merely changing a sign on one of our Nursing Units from "PATIENTS

REPORT HERE" to "NEW PATIENTS PLEASE SEE NURSE" has taken the "direct order" atmosphere away. The addition of "PLEASE" to signs is simple, and will do big things for public relations.

In the back section of the base telephone directory, we list each of our medical and dental officers with their hospital extension number and specialty. Patients are encouraged to call these doctors directly for advice and appointments. Then when they come to the hospital, patients find little difficulty locating their "personal doctor" because his name appears on a sign above his office door.

An easy way to lose friends is by abrupt discourteous telephone manners. The local telephone company has a solution for this. It's a one hour course in telephone courtesy which they are pleased to present at your request. In our hospital, we noted an immediate improvement in our public relations. This one hour was well spent and has paid off big dividends.

The selective menu has appealed to our patients and makes their stay a more pleasant one. Each morning bed patients are given a menu for the following day. They choose the foods *they* desire—not just what we prefer to give them. This system has not required any extra people to make it work, nor has it caused any more expense. In fact, it seems to be more economical as patients take what they want (they indicate this on the menu)—and eat what they take.

Another change has been in the clearance procedure for patients. At one time they were obliged to wander to six or seven places before being discharged. Now, our Information Desk does the entire clearance in one stop. A simple thing, but it means a lot.

There is no monopoly on good public relations. Any hospital can improve them with a proper attitude toward patients. This really should not be too difficult—for after all, patients are the only reason hospitals exist.

LATE NEWS

Major General Clement F. St. John, Commanding General of the Walter Reed Army Medical Center, Washington, retired April 30 to become vice president of the University of Cincinnati and director of its medical center. He will also have the title of Professor of Hospital Administration.

Major General Clinton S. Lyter will succeed General St. John as Commanding Officer of the Walter Reed Army Medical Center.

Brig. General Floyd L. Wergeland, Executive Director of the Medical Care for Dependents Program, has been designated to command Walter Reed General Hospital.

Nominated for the rank of brigadier general, Douglas B. Kendrick, Jr., Medical Corps, U. S. Army, will succeed Brig. General Sheldon S. Brownton, USAF, MC (recently retired) in the position of staff director in the medical section of the Assistant Secretary of Defense for Manpower.

Major General Richard L. Bohannon, USAF, MC, will become Deputy Surgeon General of the Air Force in June.

A Capricious Sort

By
JOSEPH HIRSH*

THERE IS one animal whose impact on man has been profound. Yet he has remained virtually unsung. He has been many things to many men—the poor man's cow, the farmer's predator and the moulder of nutritional habits for millions. He is a carrier of undulant fever and an ubiquitous symbol of sexuality. He is a capricious sort, a goat in fact, by coincidence classified by the naturalist as belonging to the sub-order *Artiodactyla,* order *Ungulata,* genus *Capra.*

According to the best bio-geneological tracings his original home was the Middle East, his original stock the *Psaang,* or *Capra aegagrus*—blood kin to the sheep, the mountain goat, the Ibex, Markhor and Tahr. *Psaang,* incidentally, is Persian for "rock-footed" and is the name given to the wild male goat. For some curious reason as yet unexplained by biologists, physicians, etymologists or Persians, the prefix *Boz* is applied not only to the wild female goat, *e.g., Bozpssang,* but to both sexes of the common domestic Iranian goat. (Needless to say this has led to some complicated and embarrassing situations in goat as well as Iranian circles. The opportunities for original research in this area, however, are limitless.)

With a fellow-ungulate, the pig, the goat shares a dubious reputation for voraciousness, converting many marginal items on the land—including trash and refuse—into edible meat and milk. In the Far East, notably Burma, goats are believed to cause eclipses, by eating the sun or the moon. This is but one religious emphasis on the goat's well-deserved reputation for orality and voraciousness. In fact a minor literature has grown around the goat's orality. The French say, "no goat ever died of hunger." The Welsh aver that "no botanist ever had half the knowledge of a goat." Indeed the nineteenth century naturalist, Cassell, reported that "He partakes of 449 plants, and refuses 126." The number refused is undoubtedly an exaggeration.

The early Jews used the goat both as a sacrificial animal and as a staple item of food. Lambs, reared primarily for wool and food, and particularly calves, were a luxury to be used only on the most festive occasions. Thus we see fresh meaning in the prodigal's complaint in Christ's parable: "Thou never gavest me (even) a kid, that I might make merry with my friends: But as soon as this thy son was come . . . thou hast killed for him the fatted *calf*" (Luke vs, 29, 30).

The ancient Assyrians were much like their Jewish neighbors in their attitudes and practices toward the goat. They developed the prototype of the *flatboat,* using goat skins as swimming-bladders or buoys. On many Assyrian monuments and friezes may be seen fishermen riding cross-legged on these inflated skins. For anyone who has skinned a squirrel, dissected a cat or a human, making a goat skin swimming-bladder, something which every family should have, is simple. After decapitating the goat and amputating its legs (leaving short stumps), peel the goat out of his skin. Steep the skin in tannin. Tie off all stumps and fill with air. You are then ready for almost anything.

In the economy of ancient Egypt, Greece and Rome goat herds played an important role. Grego-Roman law and religious practices, moreover, were replete with the goat. The Greek God, Dionysius, assumed the form of a goat; Pan, the fawns and satyrs all had goat-like bodies.

The Trojan horse was only one of many military strategems of the Greeks. In another the goat figured prominently. As the story goes, all the goats in the land were collected and on the night before the great battle

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torches were fastened to the goats' horns and lighted. The goats were then driven into the enemy's lines. Believing they were overwhelmed, the enemy fled.

As a symbol in the life of man it is difficult to determine whether anthropomorphism or its reverse is at work. Has man endowed the goat with human qualities or is it the other way round? Buffon tells us that the goat is superior to the sheep in sentiment and dexterity. Then Cassell comes along and tells us: "He is stronger, lighter and more agile than the ram; he is sprightly, capricious, and given to wander; and it is with difficulty that he can be confined to a flock." Might this not be, Cassell with tongue in cheek, describing the goat's emotional capacity and outlook rather than his physical attributes? And by a simple progression is he not describing the goat-like qualities in man when he observes him as "inconstant in his passions and irregular in his actions: he walks, stops, runs, leaps, approaches, retires, shows and conceals himself, or flies off as if he were actuated by mere caprice, and without any other cause than what arises from an eccentric vivacity of temper. The suppleness of his organization and the strength and nervousness of his form, are hardly sufficient to support the petulance and rapidity of his natural movements." Is this the description of a goat, a Pan or a man?

As a symbol of evil the goat is memoralized throughout Europe. In a variety of laws he is recorded as a familiar of witches and the Devil.

It is as a sexual symbol, however, that the goat has left his lasting imprint upon custom and language. Intercourse between women and goats has been recorded in early history in Semitic and Latin areas. It is not surprising, therefore, that in such countries as Bulgaria goats are bride's gifts—fulfilling economic as well as symbolic functions. For unexplained reasons man's (the human male's) occasional preference for sheep, rather than goats, has been noted.

As an inconstant lecher the goat has enriched the English language over the past two centuries. *To be as potent as a goat* or *to stink as a goat* are self-evident contributions to our language. *To play the old goat* is an affectionate appelation of lechery. The eighteenth century contributed: *to look at goats and monkeys,* meaning to gaze lecherously; *goat's gig or jig,* meaning copulation in a general or specific sense. The nineteenth century contributed *to play the goat or the giddy goat,* meaning to lead a (sexually) dissipated life. A hundred years ago *goat-house* meant a brothel and *goat-milker* either a harlot or the female pudend. Finally, but by no means completely, *to get his goat* is to reduce a man to extreme frustration and rage.

The psychological significance of the goat in the symbolic life of man is matched only by the importance he exerts on the medical life of man—on his nutritional status and dietary habits.

The Mediterranean, which is the goat's birthplace and original home, has been subjected to a variety of capricious aggressions over the centuries. Invasions, droughts, famines, and plagues have harassed Mediterranean countries from time immemorial. The deserts of many of these basin countries are attributed to three animals—man, the goat and locusts.

The symbol—and the perpetuator—of the widespread soil erosion of the Middle East is the free-ranging goat. Long ago, farmers whose lands were too poor for cultivation turned to goat raising. Soon they learned that goats not only survived but seemed to thrive on barren land. As the goats multiplied, the problems of soil erosion multiplied, for they tend to eat every green sprig, roots included, and pound the soil to dust. Cyprus, Greece and Israel are typical of the countries which have had to come to grips with the reality of the goat. What Cyprus did may serve as a model for people elsewhere in the world.

Thirty years ago, Cyprus was one of the most overgrazed and overeroded pieces of real estate in the world. Its people were malnourished, diseased and rapidly becoming destitute. Today, it is fast becoming a workshop of progress.

In 1878 Cyprus emerged from three centuries of Ottoman rule with an impoverished peasantry and a tradition, typical also of other Ottoman-dominated countries, that permitted free use of public resources to the extent that each man could take and exploit by force or guile all that he could get away with. The British introduced improved standards of public health and law enforcement, and the population began to grow rapidly. But as it grew the problem of food became more and more serious, for the land was losing its capacity to produce. The forests were burning up. The streams were either torrents or dry beds. The great central plain, the chief granary of the island, was becoming drier and more barren every year, and thousands of goats ranged over it freely.

Reports were written, speeches were made, and laws to control goats were enacted. All failed because no employment was found for the numerous island goat herds, who became the world's first goat-leggers.

In 1933 the government through the Forest Department established a kind of Civilian Conservation Corps program. Road building, reforestration and sheep raising (as a substitute for goats) constituted the bulwark of the program. As a consequence today 98 percent of the mountain forests are free of grazing and 30 percent is fully productive. The health and nutritional status of the people have improved markedly.

With goats as destructive as they are, it may seem strange that over 55 percent of the island's goats are permitted limited freedom. Actually they constitute a form of nomadic or semi-nomadic husbandry which may make possible the only effective use of non-arable or wasteland. Like many other Mediterranean countries Cyprus is not a land of grasses, but of weeds, shrubs, and brush. Its topography is not conducive to raising cattle or even sheep. But goats thrive on it.

This practice of turning animals loose to forage for themselves is neither unique to Cyprus nor to the Mediterranean. We here in America in the early days of colonization used to turn our cows loose in the forest. To be sure, their milk yield was very small. But since there was no expense involved in feeding them nor any large demand on the open market for the milk, it made no difference.

On August 19, 1950 barely two years after the creation of the State of Israel, the Knessett (Parliament) enacted legislation called "Protection of Flora Law (Goat Damages 5710, 1950)". This law followed the pattern established by Greece and Cyprus in dealing with the problem of the free-ranging goats who degraded the land. The Israeli law was designed to achieve a reduction in the goat population thereby preventing futher depredation by free-ranging goats, particularly of grain, garden areas and of woodlands. The first object of the law was achieved by setting up a firm ratio of goats to land, i.e., one goat per 20 dunams gross land or one goat per 5 dunams or irrigated land. (5 dunams, incidentally, or the Latinized version, *dima* = 1 acre. It will undoubtedly be recalled that 1 acre = 440 square feet which is easily convertible to square meters if factorized by 39 plus inches, I think.) The second purpose of the law was achieved by restricting goat herding to the narrow confines of yards contiguous to homes.

Concomitant with the enactment of this law was the establishment, as in Cyprus, of a large land reclamation and reforestation public works program. Such a program had been carried out on a limited scale for many years prior to the establishment of the State, but additional impetus was given to it by the enormous increase in population as a result of refugee immigration.

It is no mere accident that the lives of men and goats have been interwoven throughout history. In those places where men have congregated and become most congested—in Mediterranean Europe, in the Near and Far East—goat populations are likewise thickest. For them the lessons of Cyprus, Greece and Israel have particular meaning.

Preventive Medicine in the American Revolutionary Army

By
HOWARD LEWIS APPLEGATE

II

AMERICAN REVOLUTIONARY Army surgeons were concerned with many aspects of treating the sick and wounded. Naturally, they tried to find the causes of diseases so that preventive methods could be instituted, and they also administered remedies. Military preventive medicine developed from the rationalization that the Army could be kept healthy by the maintenance of certain ideal living conditions.

In the volunteering and recruiting that followed Lexington and Concord, almost anybody standing on two feet was permitted to enlist in the Army. In fact, recruiting officers enrolled vagrants, the disabled, drunkards, and other undesirables. Many of these poor physical specimens were potential hospital patients. One method to prevent these men from serving in the Army would have been to examine all recruits, rejecting the physically unfit or sick. After 1776, surgeons were expected to attend all musters, but this order was not consistently obeyed. The transition from civilian to military life was so extreme that new soldiers were frequent victims of disease. The indiscriminate recruiting policy naturally brought into the Army men who were unequal to military life, because of age or physical condition. Consequently, many were victimized by disease themselves, and also, because of the close association relative to Army life, transmitted their illnesses to healthier soldiers.[1]

Clothing was one factor which affected the soldier's health. Contemporary medical theorists suggested that the men wear woolen or flannel suits in the winter and cotton suits in the summer. This idea was never widely adopted because each soldier would require two uniforms, something which the lack of money and cloth would not permit. Surgeon Benjamin Rush asserted that men who wore flannels contracted fevers less frequently than did those who wore linen. Actually, the basic problem with clothing was the scarcity of uniforms rather than ignorance of the relative merits of different types of cloth.[2]

The health of the army was also dependent on good food. The official ration was: fresh beef, pork, or salt fish; bread and flour; peas, beans, or other vegetables; rice or cornmeal; milk, rum, spruce beer, or molasses; and salt and butter. As the surgeons recommended fruits and vegetables, two methods were employed to supply the Army with produce; the planting of military vegetable gardens and establishment of farmers' markets in the camps.[3] Extensive eating of meat, especially pork, was not advised by the surgeons. It was realized that flour was most nutritious when made into well baked bread or biscuit. Baking was an art and flour could be ruined if improperly prepared. Therefore, most companies had special bakers, whose work was supervised by Christopher Ludwig, the Continental Baker. On long campaigns, baked goods were prepared in advance to prevent the men from eating poorly made flour cakes. Those who ate hard bread were more healthy than those who rationed daily on "fire cakes and water."[4] It was also essential that food be properly cooked. In the first few months of the war the men were allowed to cook their own provisions as they pleased, but as the men were inexperienced, the rations were often spoiled or made useless by improper cooking techniques. Although culinary talent was conspicuously absent in the Army, men who showed some ability were appointed cooks and placed in charge of company kitchens, which were inspected daily. Lack of food, poor rations, badly prepared provisions caused malnutrition and often

weakened the soldier to such an extent that he became the victim of other ailments.[5]

General Washington was alarmed at the high rate of alcoholic beverage consumption in the Army. Most regiments were issued liquor rations, and the soldiers sometimes could purchase more from civilian sutlers. After several deaths were attributed to liquid concoctions sold by greedy sutlers, the sale of liquor was strictly regulated. There were several reasons why attempts were made to control drinking. Surgeons noted that alcohol left the body in a weakened condition and more liable to be affected by the elements. Officers felt that unrestrained use of alcohol caused the men to neglect their military duties, as they were commonly subdued by the "barrel-fever." Liquor was the suspected cause of fevers, flux, jaundice, and camp disorders.[6]

A most important resource for an army was pure water in sufficient quantities. Soldiers were given specific directions how to obtain their water from the centers of moving streams or pure wells. Impure water was made wholesome by mixing it with vinegar, which was unfortunately scarce. Those who drank putrid water often caught colds or the flux.[7]

Camp site locations and shelter partially affected the health of the Army. Medical theorists warned against camping near swamps, marshes, ponds, forests, or crosswinds, because it was believed that fevers spread more rapidly in these areas. Frequent changing of camp sites was suggested. In the winter months, most soldiers were barracked in wooden huts. As the men were not talented hutmakers, their crude efforts resulted in poorly built small log and earthen huts which were leaky, drafty, and cold. Hut inhabitants often suffered from pneumonia, colds, and fevers. Lack of wood and Army movements sometimes delayed hut construction, and men in this situation were forced to pass the winter in tents. In summer, a tent was issued to every six to ten men. Tents were virtually useless in rainy weather, because of constant leaking, resulting in an increase of summer colds. When men slept on the ground or in woods, fields, or trenches, the disease rate increased.[8]

Weather naturally had a great effect on the soldiers' health. Contemporary surgeons argued that rain caused colds, fevers, ague, and jaundice, and that cold weather prompted fevers and pneumonia. During hot weather, many troops became fatigued because of sun strokes, constant marching, lack of water or indiscriminate drinking of cold water. The changeable air—hot in the daytime and chilly at night—also caused sickness.[9]

Exercise was also essential for a healthy army. Medical theorists suggested that all exercise in the summer months should be done before the heat of the day. Officers tried to follow this advice whenever possible. Moreover, the ranks were encouraged to participate in active sports. It was apparent that disease was more rampant in regiments which did not have regular exercise periods.[10]

Great emphasis was placed on personal cleanliness. As Enoch Putnam so aptly wrote, "The officers first duty is to have the soldiers clean and neat for the health of the men and to keep pride in himself."[11] However, many soldiers resented official interference in their personal lives and their refusal to cooperate forced conscientious officers to penalize those men who disobeyed the regulations.[12]

The cleanliness regulations covered many different kinds of situations. Frequent bathing in warm running water was advised. Some soldiers felt privileged to bathe, others only washed when ordered to do so. Many times bathing became a mere formality because of the scarcity of soap. The soldiers were encouraged to wash their uniforms as often as the weather and military movements would allow. Disobediance forced the officers to establish regular washing days, when all were ordered to clean their clothes.[13] Surgeons, insisting that uncut or uncombed hair caused perspiration and accumulation of filth on the head, rec-

ommended frequent hair-cuts or daily greasing and combing of the hair. Daily facial shaving was also advised. Men with exceptional talent in haircutting were made official regimental barbers. These rules were particularly irksome to the soldiers, many of whom were farm boys unaccustomed to certain refinements of Eighteenth century town life.[14]

Camp sanitation was a necessary prerequisite to a healthy army. Men on fatigue duty cleaned streets, and collected garbage and litter. Orderlies daily inspected the barracks to see that they were neat and clean. Men who littered camp or had dirty quarters were fined. Outhouses or "necessaries" were built near the camps, preferably over running streams which carried the waste away, or over deep pits which were frequently covered with dirt. Many men from rural areas were not used to these facilities and it was difficult to persuade them to use these conveniences. Those who willfully refused to use the outhouses or who were caught "easing about the camp," were court-martialled, reduced in rank, fined, or whipped.[15]

The American Revolutionary Army surgeons realized that many diseases could be prevented by the maintenance of certain ideal conditions of military life. They persuaded General Washington to regulate the men's habits of cleanliness and tried to impress upon the men, the value of proper clothing, shelter and food, the importance of choosing good campsites, and the necessity of exercise. Unfortunately, many of their recommendations were not put into practice in the companies, apparently because many officers on the lower levels were simply not interested in these problems or were ignorant of their existence. This helps to account for the continuing presence of sickness in spite of the surgeons' precautions. The surgeons of the American Revolutionary Army made great strides in preventive medicine, but because of circumstances beyond their control, they were unable to put their ideas into practice. Thus, the lives of many Revolutionary soldiers were needlessly lost.

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THE WHITE HOUSE

Armed Forces Day

BY THE PRESIDENT OF THE UNITED STATES OF AMERICA

A Proclamation

WHEREAS the survival of our cherished freedoms is dependent in large measure upon the capabilities of our armed forces to discourage totalitarian aggression; and

WHEREAS the armed forces of the United States serve as a unified team, at home and across the seas, in the pursuit of a durable peace, and

WHEREAS the strength of our armed forces rests not alone upon their active and reserve members, our industrial productivity, and our human resources, but also upon the understanding and support of an informed American people; and

WHEREAS we seek to acknowledge and to manifest our appreciation for the dedication and self-sacrifice of the members of our armed forces and their families:

NOW, THEREFORE, I, JOHN F. KENNEDY, President of the United States of America and Commander in Chief of the armed forces of the United States, do hereby proclaim the third Saturday of May in 1961 and the third Saturday of May in each succeeding year as Armed Forces Day.

I direct the Secretary of Defense on behalf of the Army, the Navy, the Air Force, and the Marine Corps, and the Secretary of the Treasury on behalf of the Coast Guard, to designate that day each year for appropriate ceremonies, demonstrations, and displays both at armed-forces installations and in civilian communities at the invitation of civil authorities. The Secretary of Defense, as my personal representative, shall assume responsibility for initiating, formulating, and supervising the program contemplated by this proclamation and for soliciting the participation and cooperation in such program by civil authorities and distinguished private citizens.

I invite the Governors of the States, the Commonwealth of Puerto Rico, and other areas subject to the jurisdiction of the United States, and the Commissioners of the District of Columbia to provide for the observance of Armed Forces Day within their jurisdictions each year in an appropriate manner designed to enhance public understanding and appreciation of the armed forces of the United States as defenders of freedom at home and abroad.

I also ask my fellow Americans, as an expression of support for their armed forces and as a symbol of their unity in devotion to the preservation of our country, to display prominently the flag of the United States on Armed Forces Day.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Seal of the United States of America to be affixed.

DONE at the City of Washington this eighteenth day of March in the year of our Lord nineteen hundred and sixty-one, and of the Independence of the United States of America the one hundred and eighty-fifth.

JOHN F. KENNEDY

(SEAL)

By the President:

DEAN RUSK

Secretary of State

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Around the World

(Ser. IV, No. 5)

By

CLAUDIUS F. MAYER, M.D.

EGYPT has a total population of about 24 million. In 1917, the Egyptians were very backward people. The number of illiterates amounted to about 91%. Since then, *many schools have been built* according to a well-planned program, and by next year the number of primary schools will reach 10,000 while the annual growth of the school population at this level is now 50,000. At present, Egypt has approximately three million children in its various schools. All of them, from the elementary school pupils to the university students, are under medical supervision by the state, the supreme authority in health matters being the *School Health Department*. The school hygiene also extends over the students of the universities of Cairo, Alexandria, and Ain-Shams. *A fourth university* will open at Assiut. Moreover, the almost thousand years old Islam university of El-Azhar (founded A.D. 971) is also still active. The total number of university students is over 60,000; among them there are *7,542* medical students, and 479 veterinary medical students. The students in Cairo have their own wings at the Agouza Hospital, one for men and one for women. It is surprising how the women of Egypt have turned toward higher education. The statistical figures show that 62% of the students at the higher educational establishments are women.

The main effort in the *public health care of youth* is directed against *infections*. In the North of the Nile Delta, malaria is but little known. In the country districts, a good deal of the health education and of the health services must be aimed at *bilharziasis and at helminth infestation*, especially ankylostomosis. In Cairo, the drinking water is good so that infections from the drinking water are hardly ever observed. Since 1946, with the increased use of the DDT insecticide, lousiness has been reduced, and rickettsiasis has been stopped. *Vaccinations are obligatory* against smallpox, and, with the combination serum, against diptheria, tetanus and pertussis. Until the first year of age, infants are inoculated with the *BCG vaccine* against tuberculosis, and the vaccination is recorded on their birth certificate. Recently, inoculations were also made against poliomyelitis; the Salk vaccine used came to Egypt from Canada and Denmark. Until now, about 200,000 children have been reached in the anti-polio campaign. About 140 cases of poliomyelitis can be observed monthly, mostly among children of the 1-2-year age group.

Measles in Egypt occurs in two epidemics yearly, yet its mortality is very low. The death is usually due to a complicating bronchitis. The peak of measles morbidity is in the spring and in the autumn. The most frequent infection, especially of the subtropical summer, is *gastroenteritis*. This infection is the cause of the highest specific mortality among children (133 per 1000) while the rest of infections have a total mortality rate of 5.5% for the children. Egyptians believe that the heat is to be blamed for the diarrhea; therefore, they keep their children in the shady places. It is true, that in the winter months no similar dysentery exists. Bacillary dysentery is now under study by an observation team of the World Health Organization.

Tuberculosis is a prominent disease of Egypt, though in former years the country was considered a climatic refuge against the "white plague." The number of tuberculotics is about 250,000; this is at least the number of the "reported cases." A general survey of the households by x-ray films

has already started. In Cairo, BCG vaccination is obligatory until the 12th month of age, while in the country side of Egypt it is left to the choice of the parents whether they want to protect their infants. After one year of age, the tuberculin test is made. But anyone who combats infection in Egypt will find many difficulties and obstacles.

Cairo has about 2.5 million inhabitants. For their service, they have *various health centers*. Eighteen centers exist for the welfare of pregnant women and for the counselling of the mothers. Women like to come to these centers. For instance, in the Maternity Center of South Cairo, about 3000-4000 women are examined every month. The pregnant women will usually come in the 5th or 6th month of pregnancy, and thereafter they are recalled for weekly or biweekly visits. According to such a center, the *infant mortality* is about 70 to 80 per 1000. The prenatal mortality reaches 2% to 3%. The average number of children in an Egyptian family is about 6. Youth marries rather early, around the 16th year of life. After delivery of their children, mothers will usually appear at the center for postpartum examination. Though their domestic hygiene is still not perfect, *puerperal fever* is hardly known in Egypt. Similarly, there are said to be few cases of venereal disease. Nowadays, the number of syphilitic women at the centers is estimated at 1% or 2%, while formerly it used to be 30%. The *treatment of syphilis* at the maternity centers is carried out in two stages with alu-penicillin in the form of 10 injections for each stage, each injection being 600,000 units. This particular maternity center (South Cairo) which was erected in 1927, has a staff of 4 physicians, 3 midwives, 16 nurses, 1 pharmacist, 16 auxiliary midwives, and 40 female students. The wall of the center is decorated with very *impressive posters* which caution the mothers against tuberculosis in their babies and urge them to get the BCG vaccination. An old-Egyptian relief may also show instructively how the mother's milk can be kept in pots to be exposed to the activating sunrays for the prevention of rickets.

The *school health for entire Egypt* is supervised by the special School Hygiene Center, which is in Cairo. Here, the results of the examinations by the school physicians are assembled from all over the country. Surprisingly high is the rate of *trachoma among the school children*. As in China, in Egypt also, the children themselves carry out the preventive treatment of trachoma by the instillation of the prophylactic drops. For this purpose, a student is selected, who is a reliable trustee, for each class. In the elementary school of Egypt, trachoma rates as high as 38%, and in the country districts many are the partially blinded children. Great efforts have also been directed against *myopia*, and eyeglasses are distributed free for those children who need them. The dental status of the school children is very bad, and caries counts run up to 70%. *Bilharziasis* is also very wide-spread; the general rate of infection is 40%. The population is cautioned many ways that the water of the Nile is contaminated with fecal matter, and that it is dangerous to take a bath in the venerable ancient river; nevertheless, mostly for superstition, some Egyptians will even drink the water of the Nile. Bilharziasis as well as other forms of helminthosis are especially high in the Delta and in Lower Egypt; for instance, the rate of bilharziasis at Kafr-el-Sher in the Delta is 20% among students, while at Minieh (Middle Egypt) it is only 8%, and at Sohag (Upper Egypt) it is only 7%.

The *mortality rate of small children* is highest, however, in Upper Egypt, due to the heat; often, small children die from dyspepsia on breast milk. It is interesting to know that pulmonary carcinoma is almost unknown in the Egyptian population. Even the incidence of *uterine cervical cancer* is extermely small. The children's health is in the hand of about 1000 *school physicians*. The goal of the Egyptian government is to have one physician for every

5000 children and one social worker for every 1500 children. When this ratio will come it is hard to say. The *five medical faculties of Egypt* (namely, 1 in Assiut, 3 in Cairo, and 1 in Alexandria) produce annually a little more than 300 new doctors. The school physicians are under the supervision of the mentioned special department of the Ministry of Health. The School Health Department includes 4 sections, for prevention, treatment, social hygiene and personnel affairs. The treatment section includes also certain reserved beds in the clinics of Alexandria and Cairo. Beds are also reserved for the school children in the sanatoria, and convalescent centers. There are also 40 stations in the country for the observation of dermatological diseases and examination of the scalp. Many of the local policlinics also belong to the school-health system, at least in regard to certain examinations of the blood, feces, and of the dental status of the students. In summary, it can be said that—as a German observer (K. Biener) also saw it—great attention is paid to the children's health and to the development of school hygiene in the United Arab Republic.

For the *resuscitation of the organism* an experimental research laboratory was set up at Moskva by the Russian Academy of Medical Sciences. It is a unique institution in Europe. It continues to investigate the problem of fight against premature death. Under the direction of V. A. NEGOVSKY, pathophysiologist, the scientific collaborators of the laboratory are studying the methods and means by which a dying body can be restored to life. The Soviet studies penetrate into the innermost secrets of Nature. Even if respiration has stopped and the heart does not beat, it still does not mean that the body is dead. There are 5 to 6 minutes while some minimum of metabolism is preserved, and the person is in a so-called *state of clinical death*. If special help comes to him in time, as the workers in this laboratory have found, in many cases of this period of clinical death the dying man can be brought back to life. After many experiments on animals, the scientific staff of the laboratory has elaborated effective methods for the resuscitation of the life functions of the organism. These methods are now widely used in Russian medical practice, and "thousands of people" are said to be reanimated, among them young mothers dying after child-birth. The experimental studies were stimulated by the discovery that, by *the use of hypothermy*, a state of clinical death can be prolonged in experimental animals. American visitors, among them a noted neurologist (Forster) stated that the resuscitation team of this laboratory has 15-20 occasions a month to come to the rescue of the injured, but, unless they arrive within the first 5 minutes after the stopping of the heart beat, the resuscitation is unlikely.

Last year, this *Laboratory of Experimental Physiology for the Resuscitation of the Organism* held a conference at which doctors of the Moskva center for the treatment of "terminal conditions," and other researchers from various parts of Russia took part. The Moskva center is now greatly interested in the *direct massage of the heart* done within the general combination of measures for the re-establishment of the life of the organism. In combination with artificial respiration, direct heart massage, when started 1½ to 2 minutes after the beginning of ventricular fibrillation (experimentally caused by an alternating current of 127 V), will succeed in maintaining the arterial pressure at a level of 60-70 mm Hg for 2 hours. The electroencephalograph shows that during the first hour of heart massage, no substantial changes occur in the *electric action of the cerebral cortex*. During the 2nd hour, signs of some inhibition may appear. The re-establishment of heart activity with the aid of electric defibrillation could be done in all dogs, independently from the length of the preceding heart massage. As to the rest of the life functions of the organism, the best results were obtained in animals in which

the heart massage took place not more than 60 minutes after stoppage of the heart. With the heart massage carried out for 120 minutes, all animals died either from acute weakness of the heart or from the marked changes in the myocardium. Russians are now able to resuscitate dogs two hours after clinical death (kept under conditions of deep hypothermia). The question is how to make useful the deep hypothermy for the *treatment of human "terminal conditions."*

It happened during the First World War that American Army officers observed the terrible epidemics which *exanthematic typhus* caused *in the Serbian Army.* At that time the Serbian soldiers were infested with lice. We now hear from the Novi Pazar district that, at least in that part of Yugoslavia, the population is still very much lousy. According to a recent report of the *District Health Institute of Novi Pazar,* this essentially rural area, numbering about 120,000 inhabitants, is still very backward in hygienic and sanitary respect. Many rural and even urban households lack the basic sanitary facilities for a healthy life. Many houses are damp, many have no privy, and the stable manure of the animals, which is mostly kept in the house itself, is scattered around the courtyard. The houses are very primitive, often consisting of a single room in which 3-4 persons are living. Almost 90% of the rural houses are from poor building material; even in the city of Novi Pazar, 81% of the houses are hardly habitable. Many have only an earthen floor, and only single windows of very small size. In 47% of the rural houses, and in 33% of the city houses the inhabitants are making *their bedding on the floor;* there are no proper beds. Many of the rural houses have no court at all. The Serbians of this district change their clothes mostly about once a week, and 61% of them will regularly take a bath. Nevertheless, 59% of the rural houses and 20% of the *households in Novi Pazar are louse-infested* because the housewives do not know how to wash their linen properly. The underwear is not boiled, and the people in the villages often do not use soap for laundering.

The nutrition of the rural Serbians is also deficient. They drink annually 75 liters (150 quarts) of milk, eat 7.2 kg (ca. 18 lb) of meat a year, and only 40 eggs. No wonder that with such a sanitary status the *infectious suppurative skin diseases* are frequent among the children and students. Of course, the lousiness is responsible for the frequent outbreak of typhus epidemics (almost yearly). The food of the rural population in this part of Serbia in monotonous and tasteless. For these reasons, an action was started in 1959 for the *sanitary and health education of the rural population.* One of the greatest obstacles is that many Serbians are illiterate, and the health-educational pamphlets are the first readers actually which they ever had in their lives. During this health action, more than 17,000 households were surveyed, and their sanitary conditions recorded on cards. These files are to be used for comparison to see whether the sanitary recommendations are followed by the household. The wives are given special training in the proper method of laundering, and in the suitable way for preparing tasty meals for their families.

According to a recent survey of the *medical conditions in Hungary,* it was found that surgery has undergone essential changes during the past two decades. Today, the *Hungarian surgeons* are mostly working on the basis of a physiopathological point of view, instead of the former morphological consideration. All fields of general surgery are successfully cultivated including such new fields as thoracic surgery and particularly cardio-vascular surgery. Thus, at Budapest, a strong *center was created for cardiac surgery* where the work of Littman, Temesvàri, Kudász and others is outstanding and well-known even abroad. The new school of thoracic surgery was supposedly created by the Russian Boris Petrovski, who is now professor at Moskva; actually he worked in collabora-

tion with the now deceased famous *Sebestyén,* head of the *I. Surgical Clinic at Budapest.* This clinic, and the staff of the László Hospital created some marvelous results in cardiac surgery with the solution of difficult cases of pathology of the heart. The works of this clinic appeared in many publications. They included mitral commissurotomy, surgery of pulmonary stenosis under hypothermia, surgery of combined cases of Eisenmenger's complex with persisting Botallo's duct and aortic coarctation, and so on. In thoracic surgery, many remarkable publications appeared with reference to simultaneous bilateral lung resection, iron lung and artificial respiration with intrathoracic overpressure, bronchoesophagoscope with a ring mirror, and so on. *Artificial hibernation* was especially studied by VÉGHELYI and his staff who also spread this method of anesthesia so that hibernation and reanimation is now practiced at every larger Hungerian medical center. It was also suggested that the district hospitals be staffed with a *well-trained cadre of anesthesiologist specialists.* This is indeed a field which interests many Hungarian surgeons. Some of them manufactured their own complicated refrigeration apparatus. At the same time, such older fields as *plastic surgery,* in which the Hungarian specialists were always eminent, has not been neglected. This field is now combined with traumatology in an effort to create esthetic scars after large burns of the human body, such as may result after the use of thermonuclear weapons. A new line in the work of the contemporary Hungarian surgeon is *the prevention,* the detection of certain affections at an early stage and their surgical removal or repair.

Talking of plastic surgery reminds us of the English *plastic surgeon* who recently *collaborated with a psychiatrist* to cure a woman of her schizophrenic obsession. She had a large nose, and she thought that people looking at her might think that she had a large "membrum virile" and she was only a disguised man. After the correction of the shape of her nose, she was greatly relieved of her paranoid schizophrenia.

Some cautioning words come from a Fire Protection Association that *electric blankets* are far less innocent than the old-fashioned warming pans and hot-water bottles. In a single year they (the blankets) caused thousands of fires, and were responsible for at least 20 deaths. With such blankets, the danger of electric shock is not very serious, at least not as much as the danger of fire. If the blanket is folded or overlaid with pillows and bedding, the temperature may rise dangerously, or short circuits may develop. Most of the fatalities happened among people lying on electric blankets with the current still switched on.

Some time ago an English painter had the idea of trying out the following experiment in a sanatorium: in the wards, he hung reproductions of *works of great masters,* which were changed regularly. The effect was so excellent *upon the patients' morale* and their physical condition that the experiment is now continued on a large scale. Reproductions of works are being circulated among British hospitals and the results are surprising. In Australia, *fresh flowers* are arranged in the hospitals daily, and the nurses who change them reported similar great influence of the flowers upon the physical health of their patients. Thus, an intense artistic and cultural activity is growing up in hospitals and sanatoria which forces the patients there to devote themselves to something else than worry. *Art and beauty creates in them a new confidence,* and thus "suffering is no longer a prison, it becomes a way." . . . Multa Paucis!

The Sir Henry Wellcome Medal and Prize

COMPETITION FOR 1961

THE AWARD consists of a medal, a scroll, and a cash prize of $500 to be presented during the Annual Meeting of the Association of Military Surgeons of the United States, November 6, 7, and 8, 1961.

The competition is open to all medical department officers, former such officers, of the Army, Navy, Air Force, Public Health Service, Veterans Administration, The National Guard and the Reserves of the United States, and commissioned officers of foreign military medical services. No person shall be eligible for a second award and no paper previously published will be accepted.

Six copies of an essay (3,000-10,000 words) which reports some original work in the field of military medicine must be submitted to the Secretary of the Association and must bear a postmark no later than 15 June 1961. Manuscripts must be double spaced. The true name of the author must not appear on the manuscript. A *nom de plume* or symbol must be used. A sealed envelope bearing the *nom de plume* or symbol on the outside and an enclosed paper giving the true name and address of the author must accompany the essay.

Subjects may be in the theory and practice of medicine, dentistry, veterinary medicine, or sanitation. The winning essay becomes the property of the Association and will be published in MILITARY MEDICINE.

Federal Nursing Service Award–1961

THE AWARD consists of an honorarium of $500 and a scroll which will be presented during the Annual Meeting of the Association of Military Surgeons of the United States.

Any nurse in the Federal Nursing Services is eligible providing she submits an essay (3,000-10,000 words) which reports on the most beneficial study of or contribution to professional nursing in any area of practice. The subject material of the essay may be the result of the study or actual experience or a combination of both.

Essays must be submitted in six copies, double spaced, on standard size paper with the name of the author omitted, but a *nom de plume* substituted. An accompanying sealed envelope with the title of the essay and the *nom de plume* on the outside and a paper on the inside bearing the true name and address of the author must accompany the essay.

The manuscripts must be mailed to the Secretary of the Association and bear a postmark no later than 15 June 1961.

NOTES

Timely items of general interest are accepted for these columns. Deadline is 1st of month preceding month of issue.

Department of Defense

Senior Medical Advisor—FRANK B. BERRY, M.D.

Deputy Ass't Sec'y of Defense (Health and Medical), Off. Ass't Sec'y of Defense for Manpower—EDW. H. CUSHING, M.D.

DOCTOR DRAFT

The Department of Defense has placed a Selective Service call for 250 physicians, all of whom will be assigned to the Department of Air Force. This is the first call for physicians which the Department of Defense has placed since 1957.

RETIRED

Brigadier General Sheldon Brownton, USAF, MC, who has been staff director for health and medical activities, Office of Assistant Secretary of Defense (Health and Medical), now under the Office of Assistant Secretary for Manpower, retired from military service on May 1.

General Brownton has been designated as Chief Medical Director for the Worlds Fair, New York City. He will maintain his residence in Washington for the present.

Succeeding General Brownton is Colonel Douglas Kendrick, MC, USA, who has been Surgical Consultant in the U. S. Army Forces, Europe. Colonel Kendrick was co-winner with Captain Lloyd R. Newhouser, MC, U. S. Navy (now retired) of the Gorgas Award in 1953.

GLOBAL MEDICINE STUDY NEEDED

Physicians must familiarize themselves with the diseases that are peculiar to other nations. Dr. Chapman H. Binford, Chief of the Geographic Pathology Division, Armed Forces Institute of Pathology, recently pointed out the need "to establish a well-documented pathology file on diseases that might occur wherever military operations may occur."

Rapid air transportation can cause the introduction into the United States of some of the diseases that are now non-existant within its borders. Early diagnosis from the standpoint of treatment and public health is important.

SURGEON POSITION

The new combined uniform force of STRAC and TAC implies the need of a Surgeon on the staff of the Commanding General for planning purposes. It is understood that such plans are being formulated.

Army

Surgeon General—LT. GEN. LEONARD D. HEATON

Deputy Surg. Gen.—MAJ. GEN. THOMAS J. HARTFORD

SGO ASSIGNMENT

Captain Emerson C. Harvery, Jr., Medical Corps, has been assigned to the Office of the Surgeon General where he will monitor the Industrial Medical program for the Army.

GENERAL DOAN

Recently promoted Brigadier General Howard W. Doan, MC, Director of Personnel and Training, Office of the Surgeon General, is a graduate of the Medical College of the University of Iowa (1932), and received an M.A. degree in Public Health from the University of California in 1949.

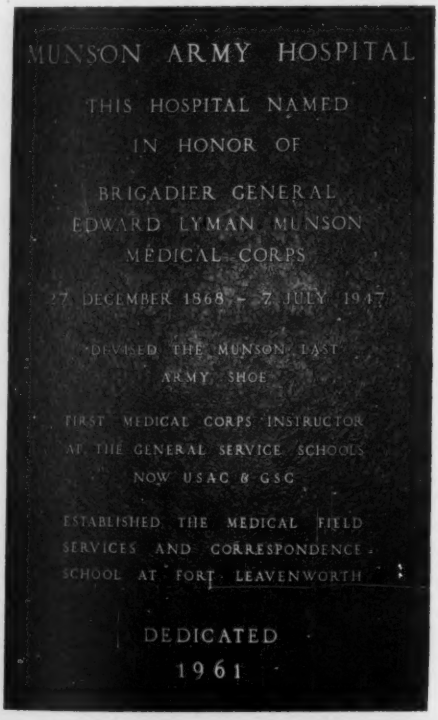
He has held many important positions one of which was Executive Officer of the

Office of The Chief Surgeon, European Theater of Operations, during World War II, and later that of Superintendent of Gorgas Hospital in the Panama Canal Zone. Prior to his present assignment he was Surgeon of the First U. S. Army Area.

MUNSON ARMY HOSPITAL

More than 400 persons turned out March 29 to attend the dedication of Munson Army Hospital, the Army's newest health center.

Maj. Gen. Thomas J. Hartford, Deputy Surgeon General of the U. S. Army, gave the dedication address for the $3,000,000 facility. In his remarks, the general gave tribute to Brig. Gen. Edward L. Munson, U. S. Army Medical Corps, for whom the hospital is named. General Munson was the inventor of the Munson medical field service tent and the Munson last Army shoe; both of which are still being used. He was associated with Ft. Leavenworth as professor in the Army Service School—now the Command and General Staff College—and founded the Medical Field Service and Correspondence School here.



PLAQUE AT MUNSON ARMY HOSPITAL

COL. JOSEPH T. CAPLES, MC, USA

Introductory remarks were made by Colonel Joseph T. Caples, post surgeon and commanding officer at the hospital. Colonel Caples, a native Missourian, is at Ft. Leavenworth for the sixth time—three times during his childhood when his father, an officer in The Army Engineer Corp was here, twice as a student officer, and currently as post surgeon since 1959.

Messages were received from General Munson's two children, Mrs. William A. Carter, the former Katharine Munson, wife of the Governor of the Panama Canal Zone, Balboa Heights, C. Z., and Brig. Gen. (Ret'd) Edward L. Munson, Jr., Flying W Ranch of Wolf, Wyo., expressing their regret at being unable to attend the ceremony. General Munson, Jr., is recovering from an automobile accident and is at Fitzsimons General Hospital in Denver, Colo.

TO TRAIN AT BAMC

Twelve U. S. Army Medical Service reserve units will train at Brooke Army Medical Center this summer according to Major General John F. Bohlender, Center Commander.

The units involved are the 256th General Hospital, 360th Dental Service Detachment, 366th Orthopedic Detachment, 389th Thoracic Detachment, 341st General Hospital, 114th Evacuation Hospital, 317th Medical Company (Air Ambulance), 94th General Hospital, 807th Hospital Center, 148th Evacuation Hospital, 454th General Hospital and the 323rd General Hospital.

307TH GENERAL HOSPITAL

Summer training for the 307th General Hospital, a 1000-bed Army Reserve Hospital, will be held at Camp Drum, N.Y., June 3-17.

The unit, commanded by Colonel Gerald Dorman, Member of the Board of Trustees of the American Medical Association, and Medical Director of the New York Life Insurance Company, will have the mission of opening Cantonement Hospital for the entire summer training period.

Colonel Monroe Broad, Chief of the Surgical Service of the hospital, is President of the Queens County Medical Society.

Colonel Saul Solomon, Chief of the Medical Service, is Assistant Professor of Medicine, New York University, and Police Surgeon.

Four of the nurses hold positions as supervisors and assistant supervisors at leading New York hospitals.

MEDICAL RESEARCH UNIT

The SEATO Medical Research Laboratory has been established in Bangkok, Thailand. The Army Medical Service has collaborated in its establishment.

Organizationally established as a special activity of the Walter Reed Army Institute of Research, the U. S. Component will be directed by Lt. Colonel Oscar Felsenfeld, Medical Corps. His staff will eventually consist of about 15 scientific and medical personnel.

There will be a continuing research program on infectious diseases in the area including cholera, typhoid, hookworm disease, dengue fever, malaria, filariasis, and scrub typhus.

HEALTH NURSING PROGRAM

Of major importance is the health nursing program under the Preventive Medicine Service at Fort Benning, Georgia. Four nurses are engaged in the program: Major Lillian Stiggins and Captain Alice Houle of the Army Nurse Corps, assisted by Mrs. Doris Daniels and Mrs. Hazel Macus, civilian nurses. Another civilian nurse will be added to the staff in the near future.

Major Robert H. Quinn, preventive medicine officer, said, "I feel that this program has contributed to a large extent to the education of first time mothers, promoting active participation in various immunization programs and the reduction of home accidents on the post."

Activities of the health nurses include assisting a doctor in conducting prenatal classes, giving instruction in hygiene for obstetrical patients at Martin Army Hospital, supervising a Dependent Immunization Clinic, working in a Well Baby Clinic at the hospital, promoting cancer education for women and, in addition, making approximately 200 home visits per month. A home visit is made to each first time mother, soon after her release from the hospital.

HONORED

Colonel Peter Zanca, Chief of the Radiology Service, Brooke General Hospital, was elected to Fellowship in the American College of Radiologists recently.

At the time of the Hungarian revolt, he was Chief of Radiology Service at Fort Dix, New Jersey, and read all of the x-ray films of the Hungarian refugees who came to Camp Kilmer.

ALGAE

Like tea leaves and dried alfalfa? If so you may like algae. It is the taste that turns people against this highly nutritious food.

To overcome this unpleasant taste is the project before the Army Medical Research General Hospital, Denver.

The high protein content and the ease of production make algae a desirable subject for further investigation. This could be part of a solution to the food problem in heavily populated countries.

Navy

Surgeon General—REAR ADM. EDWARD C. KENNEY

Deputy Surg. Gen.—REAR ADM. ALLAN S. CHRISMAN

APPOINTMENT

Rear Admiral David C. Gaede, Medical Corps, U. S. Navy, Retired, has been appointed to the position of Chief, Bureau of Private Institutions, Department of Mental Hygiene, State of California. His office will be at 107 South Broadway (Room 2012), Los Angeles.

Dr. Gaede who had a long and distinguished career as a medical officer of the Navy, has served as Chief of the Department of Neuropsychiatry, U. S. Naval Hospital, Oakland. He is a Diplomate, both of the American Board of Psychiatry and Neurology in the specialty of Psychiatry, and of the American Board of Preventive Medicine.

In his new assignment he will have much to do in the development of the private facilities for the mentally ill in the State of California.

HONORED

Lieutenant Commander Lucien E. Barkley, MSC, USN, Bureau of Medicine and Surgery, was one of eleven winners of the George Washington Honor Medal by the Freedoms Foundation, Valley Forge, Pa. The award was made to Commander Barkley for his entry in the 1960 Letter Awards Program for Members of the Armed Forces on Active Duty. The subject of the 1960 contest was "My Vote: Freedom's Privilege."

RETIRED

Captains Earl A. Goldsmith, DC, and Ingram W. Ogden, DC, have been retired from the Navy.

NEW DEPTH RECORD

Commander Walter Mazzone, MSC, USN, and Lieutenant Harris Steinke, USN, simulating an actual escape from a submarine ascended from a depth of 318 feet to the surface in 55 seconds. They utilized a new hooded device designed by Lieutenant Steinke. After the feat they were examined and pronounced in excellent health.

The former record was held by Commander George Bond, MC, USN, and Chief Engineman Cyril Tuckfield, USN, when they ascended from a depth of 302 feet on October 1, 1959.

TRAINING PROGRAM

Approximately 275 Reserve medical officers of the Army, Navy, Air Force, and Public Health Service attended a two-week Military Medical Training Program at the National Naval Medical Center, Bethesda, Md., during March.

The program dealt with the medical aspects of special weapons, management of mass casualties, and medical problems posed by extremes of climatic and environmental stresses.

Since the initial presentation of the program in 1948 there have been over 3700 reserve officers that have attended.

Air Force

Surgeon General—MAJ. GEN. OLIVER K. NIESS

Deputy Surg. Gen.—MAJ. GEN. JOHN K. CULLEN

DEPUTY COMMANDER

Colonel R. Howard Lackay has been named Deputy Commander, USAF Aerospace Medical Center, Brooks Air Force Base, Texas. Commander of the Center is Brig. General Theodore C. Bedwell, Jr.

PROMOTION

Major General L. R. Braswell, USAF, MC, Air Material Command Surgeon, received his second star at Wright-Patterson Air Force Base, recently.

DIETETIC TRAINING PROGRAM

The Surgeon General has announced that the Air Force has established an 18-month dietetic program which will be conducted in two phases.

During the first 12 months, the intern will complete an internship in an American Dietetic Association approved civilian internship. The next 6 months training will be in the administration of a military hospital food service.

Young women selected for this program will be appointed second lieutenants in the Air Force Medical Specialist Corps and will receive the pay of that grade during the entire training period.

Further information may be obtained by writing to the Office of the Surgeon General, Department of the Air Force, Washington 25, D.C.

Public Health Service

Surgeon General—LUTHER L. TERRY, M.D.

Deputy Surg. Gen.—JOHN D. PORTERFIELD, M.D.

INTERNATIONAL RESEARCH OFFICE APPOINTMENTS

Dr. Martin M. Cummings and Robert H. Grant have been selected for appointment to the two top positions in the Office of International Research at the National Institutes of Health, Bethesda, Md.

Dr. Cummings, who will head the office on July 1, has been Chairman and Professor of the Department of Microbiology at the University of Oklahoma Medical School since 1959. He has also been a consultant to the Veterans Administration.

Mr. Grant who will be Assistant Chief of the office is a career Civil Service employee.

AIR POLLUTION COMMITTEE

The growing concern of the American people in air pollution has prompted the Surgeon General of the Public Health Service to enlarge the National Advisory Committee on Community Air Pollution. The membership has been increased from 12 to 15, with five members from industry, five from State and local governments, and five representing universities, professional associations, and the public.

HEALTH STATISTICS

Geographic Regions and Urban-Rural Residence (U.S. July 1957-June 1959), is a 40-page publication (PHS No. 584-C5) which presents information on various health topics for the four major regions of the United States.

In these four major regions it was found that about 40.9 percent of the persons had one or more chronic conditions, not all of which, of course, were major in nature. The rural-nonfarm areas in the South showed the lowest percent (38.8) while the urban areas of the West showed the highest percent (44.9).

The book can be obtained from the Government Printing Office for 35¢.

PERSONAL

Dr. Art A. Kramish, formerly Chief, Psychology Service at the Veterans Administration Hospital, Knoxville, Iowa, is now Chief, Psychology Service, Federal Reformatory, Chillicothe, Ohio. He has transferred to the Public Health Service.

ANTHRAX

Penicillin cut to three days the hospitalization of the first case of anthrax to be reported to the Public Health Service in 1961.

A 54-year old woman employed as a spinner in a Philadelphia goat hair processing mill where she was handling goat hair from middle eastern countries, developed

an ulcer on her forearm. Smear disclosed the presence of *Bacillus anthracis.*

Five cases of anthrax had developed in the United States in the same period of time in 1960. Twenty-three cases were reported for that year.

PUBLICATIONS AVAILABLE

A Study of Student Nurse Perception of Patient Attitudes (PHS Publ. No. 769) is now available at 45¢ a copy from the Government Printing Office.

The publication reports the methods, data, and findings of a two-year research project designed to find out how well student nurses recognize which hospital nursing services are most important to their patients.

The National Library of Medicine has issued a bibliography, *Salmonella; Salmonella Infections* (PHS Publ. No. 803) designed for the workers in the clinical and research fields of medicine and public health. English, French, German, Italian, and Spanish references have been selected.

THE CRIMINAL MAN

A course, *The Criminal Man,* is being conducted through the Adult Education Center of the Santa Barbara College, Santa Barbara, California. The instructor is Dr. Dominick J. Lacovara, a medical director of the Public Health Service, stationed at the Federal Correctional Institution, Lompoc, California.

The series consists of eleven meetings and deals with the nature, prevention, and treatment of crime. Panel meetings are part of the program.

Veterans Administration

Chief Medical Director—WILLIAM S. MIDDLETON, M.D.

Deputy Chief Med. Dir.—H. MARTIN ENGLE, M.D.

ASSIGNMENTS

Dr. Harold W. Schnaper was recently appointed to the newly created post of Chief of Research in Internal Medicine at the Veterans Administration's Central Office. He is a World War II and Korea veteran, having been on active duty in the Army from 1942 to 1945 and again from 1951 to 1953. He served as chief of the medical service for the 7th Evacuation Hospital in Germany.

Dr. Harry E. Walkup, has been appointed Assistant Director of Surgical Service at the Central Office. He is a diplomate of the American Board of Surgery and of the Board of Thoracic Surgery. He has done research work in pulmonary diseases.

Dr. Robert J. Scott who has been manager of the Veterans Administration Hospital at Fort Wayne, Indiana, has been appointed manager of the VA hospital at Richmond, Va.

During World War II Dr. Scott served with the Army Medical Corps.

RESEARCH ADVISORY COMMITTEE

Seven of the nation's top medical leaders will advise the Veterans Administration on its nationwide medical research program, as members of the newly constituted Research Advisory Committee.

Chairman of the committee is Dr. Harold Wolff, the Anne Parrish Titzell Professor of Neurology at Cornell University Medical College.

Members of the committee are: Dr. Charles G. Child (Univ. of Mich.); Dr. I. Arthur Mirsky (Univ. of Pittsburgh); Dr. Harry M. Rose (Columbia Univ.); Dr. Eugene A. Stead (Duke Univ.); Dr. Eliot Stellar (Univ. of Pa.); and Dr. Stafford L. Warren (Univ. of Calif.).

CONFERENCE BROADENED

The importance of respiratory disease of all kinds is the occasion for the renaming of the VA-Armed Forces Cooperative Studies on the Chemotherapy of Tuberculosis. In the future the annual meeting of the group will be known as the Research Conference in Pulmonary Diseases of the Veterans Administration and Armed Forces.

Dr. William B. Tucker, director of the Veterans Administration's Pulmonary Disease Service, Washington, stated that in recent years despite substantial decreases

in mortality from tuberculosis there has been increases in mortality from pneumonia, emphysema, and cancer of the respiratory system.

Respiratory diseases are now the leading cause of disability and the fourth leading cause of death in the United States.

NEW DRUG FOR TUBERCULOSIS

Thioamide is said by Dr. James H. Matthews, Washington, D.C., to show promising results in the treatment of long-term pulmonary tuberculosis patients who had failed to become inactive despite the best previously known therapy.

This was reported to the Research Conference in Pulmonary Diseases of the Veterans Administration and Armed Forces recently.

The finding was confirmed by the research conducted by the Clinical Trials Committee of the Research Committee of the British Tuberculosis Association as reported to the conference by guest speaker, Dr. R. W. Riddell, and also in a report by Drs. Roger S. Mitchell and Thomas L. Petty of the University of Colorado School of Medicine.

Thioamide was introduced into this country by French tuberculosis workers.

Miscellaneous

CONSULTANT TO PEACE CORPS

Dr. Howard Rusk will be consultant on health and medical care needs to Sargent Shriver, Director of President Kennedy's Peace Corps.

Dr. Rusk has been on many government commissions as a consultant in medical matters. During World War II he was actively engaged in the rehabilitation programs in the military services. He is an authority on rehabilitation and is head of the program at the New York Hospital-Bellevue Medical Center.

APPOINTMENT F & D

Dr. Irwin Siegel has been appointed as Deputy Medical Director of the Food and Drug Administration. He has been associate director of the New Drug Branch. A graduate of the Western Reserve University School of Medicine, he has specialized in internal medicine and is a Diplomate of the American Board of Internal Medicine. He served at the Walter Reed Army Medical Center, 1952-54.

Dr. William H. Kessenich is Medical Director of the Food and Drug Administration, the Commissioner of which is George P. Larrick.

WHO

The Work of WHO—1960 is the Annual Report of the Director-General to the World Health Assembly and the United Nations. The report is published in English, French and Spanish editions.

This is indeed an interesting report covering the problems in the various countries, and the projects that are to be undertaken. Malaria control is probably the biggest project and the eradication of this disease from the face of this globe would be a great accomplishment. The teachings must reach the lowliest in all countries.

Copies of the report are available in the United States from the Columbia University Press, 2960 Broadway, New York 27, N.Y., at $2.00 per copy.

GIFT TO HARVARD MEDICAL LIBRARY

Aviation and space medicine books, journals and booklets in the amount of some 2000 have been presented to the Harvard Medical Library by Colonel Robert J. Benford, USAF, MC, Retired. The gift will form a nucleus of a collection in this specialized field.

CLAIMS ON POLAND

U. S. Nationals having claims against the Government of Poland for the nationalization or other taking of their property are urged to file them immediately with the Foreign Claims Settlement Commission, Washington.

Claimants must produce proof that the property upon which their claims are based was owned by U. S. citizens at the time it was taken. The loss must have occurred prior to July 16, 1960.

HEART CATHETER

A remotely controlled catheter that can be "steered" through the heart has been developed by the General Motors Research Laboratories and Richard J. Bing, M.D., professor of medicine and chairman of Wayne State University's Department of Medicine, Detroit.

The tip of the catheter is "steered" by means of a fine wire stylette which transmits tension down the center of a coil spring that extends the four-foot length of the catheter to a point about an inch and a half from the tip. Tension is provided by the doctor's thumb pressure on a plunger-like device, which might be compared with the pumping action of a hypodermic syringe.

The tip is capable of 180 degrees maximum curvature. The entire unit can be withdrawn from the catheter tube once the tube has been inserted in its desired location.

RADIATION INJURIES

A report by Reuters News Service says 230,000 Japanese still suffer from radioactive injuries inflicted by the atomic bombings of Hiroshima and Nagasaki in 1945. At the end of 1960, 4,500 were still in hospitals.—*AMA News*, Mar. 6/61.

100,000 MAGNIFICATION

An electron microscope (RCA), procured recently through a grant of $51,500 from the National Science Foundation, magnifies to 100,000 times normal size. Tissues must be cut with a special microtome to 1/40 of a micron (equal to one-millionth of an inch). The microscope has been installed at the Boston University-Massachusetts Memorial Hospitals medical research building and will be under the supervision of Dr. Alan S. Cohen, director of the new Arthritis and Connective Tissue Disease Unit.

LUNG CANCER

Dr. Clarence Cook Little, in his 1960 Annual Report published recently, proposed these steps for medical researchers:

Determine whether cancer can be produced in animal tissue by applying "whole" smoke. In experiments where animals inhaled whole smoke lung cancer has not resulted.

Improve and broaden statistical investigations by obtaining information through direct medical examination, instead of by questionnaire; and by collecting information on personal characteristics and habits other than just smoking.

Improve and agree upon methods of classifying the major types of lung cancer. This would make studies of the disease and relative rates more meaningful. Some reports have associated smoking with one type of lung cancer, but not with another.

OCCUPATIONAL MEDICINE COURSE

A full-time course in occupational medicine will be given for physicians from September 8 through November 10 by the New York University Post-Graduate Medical School. For further information write: Office of the Associate Dean, NYU Post-Graduate Medical School, 550 First Ave., New York 16, N.Y.

PATHOLOGISTS TO MEET

The Wisconsin Society of Pathologists will hold its Annual Summer Meeting on June 24 at the State Laboratory of Hygiene, Madison, Wis.

"Diseases of the Central Nervous System, Non-neoplastic" is a Tissue Seminar for the afternoon session, moderated by Dr. Andrew E. Cyrus, Jr. A limited number of slide sets are available at ten dollars per set. Address: Robert S. Haukohl, M.D., Secretary, 561 North 15th St., Milwaukee.

MEETINGS

The American Psychological Association will hold its 69th Annual Convention, August 31-September 6, at the Commodore and Biltmore Hotels, New York. For further information address George S. Speer, 225 South Euclid Ave., Oak Park, Ill.

The 23rd Session of Conferences of the International Committee of Military Medicine and Pharmacy will be held in Athens, Greece, September 19-22.

For further information address the Secretary, Medical Service of the Greek Army, Athens.

WHO PUBLICATIONS

Tuberculosis. Bull. Vol. 23, No. 4/5/60. $4.00.

Leptospirosis, Brucellosis. Bull. Vol. 24/61. $2.00.

Malaria. Bull. Vol. 22/60. $2.00.

Aspects of Public Health Nursing. Pub. Health Papers No. 4/61. $1.75.

Trends in Juvenile Delinquency. Pub. Health Papers No. 5/61. $.60.

Expert Committee on Malaria. 8th Report. TRS No. 205/61. $.60.

Expert Committee on Addiction-Producing Drugs. 11th Report. TRS No. 211/61. $.30.

Undergraduate Teaching of Psychiatry and Mental Health Promotion. 9th Report. TRS No. 208/61. $.30.

Endemic Goitre. Chron. Vol. 14/9/60. $.30.

Leprosy, Serological Epidemiology, Automation, Comm. Diseases. Chron. Vol. 14/1/61. $.30.

Any of these may be obtained from Columbia University Press, IDS, 2960 Broadway, New York 27, N.Y.

U. S. GOVERNMENT PUBLICATIONS

Infectious Diseases in the Ageing. Cat. No. FS 2.60/2:D63. $1.50.

Veterans Benefits. Cat. No. Y4. V64/3: B43/6/960. $1.00.

Survival.

Basic Manual (1957) Cat. No. D101.20: 21-76. $1.00.

Change 1 to above Cat. No. D 101.20: 21-76/1. $.10.

Your Children and Their Gangs. Child Bur. Publ. 384/1960. $.20.

Programs for Older People. Cat. No. Y 3.F 31/15: 2 P94/960. $.30.

Trachoma Manual and Atlas. Cat. No. FS 2.6/2: T 67/960. $.60.

Medical X-Ray Protection up to Three Million Volts. Cat. No. C 13.11:76. $.25.

Medical Certification of Medicolegal Cases. Cat. No. FS 2.102:M46. $.15.

Any of these may be obtained from the Government Printing Office, Washington 25, D.C

PUBLICATIONS

The following publications are available from the Office of Technical Services, U. S. Department of Commerce, Washington:

Evolution Regularities as Reflected in the Epileptiform Reaction of Animals to High Partial Oxygen Pressure (#60-51068), 136 pp., $1.50. Translated from the Russian.

Problems of the Physiology of the Processes of Fatigue and Recovery (#60-51076), a book of research papers, $2.75. Translation from the Russian.

Thoracic Surgery in the USSR (#60-41284), 107 pp., $2.50. Translation from the Russian.

All-Russian Congress of Pediatricians (#60-31676), 4 pp., 50¢. A translation.

Operation on a "Dry" Heart (60-41525), 11 pp., 50¢. Translation from the Russian.

Monitoring Unit for Heart- and Respiration-Rate (PB 171140), 6 p., 50¢. Biomedical Laboratory, U. S. Air Force.

Fallout Program Quarterly Summary Report (HASL-105), 182 pp., $2.75. AEC report.

Brookhaven Symposia in Biology No. 13: Protein structure and function (BNL-608, C-30), 266 pp., $2.50.

The Origin of Life on Earth and Elsewhere: 2 (UCRL-9440), 41 pp., $1. AEC study.

The Community Impact of Peaceful Applications of Atomic Energy (TID-8202), 80 pp., $1. AEC report.

Radiological Health Handbook (PB 121784R), 468 pp., $3.75. U. S. Public Health Service.

Closed Circuit Respiratory Systems Symposium (PB 161988), 470 pp., $6. Life Support Systems, U. S. Air Force.

NEW YORK CHAPTER

The Annual Spring Meeting of the New York Chapter of the Association of Military Surgeons of the United States will be held Thursday, June 8, at the Governors Island Officers Open Mess, Governors Island, New York.

Preceding the dinner there will be a cocktail hour (5:30 to 7:00 p.m.). After the dinner, Captain F. Kirk Smith, USN, Director, Aviation Medical Acceleration Laboratory, U.S. Naval Air Development Center, Johnsville, Pa., will speak on "Some Interesting Aspects of Aerospace Medical Research."

Members may bring their ladies. Reservations, to include the cocktail party and the dinner ($6.50 per person) will be accepted by the Secretary, Colonel James Q. Simmons, Jr., Headquarters First U. S. Army, Medical Section, Governors Island, New York 4, New York. Checks should be made payable to New York Chapter, Association of Military Surgeons—U. S.

Also a cocktail party is scheduled for Wednesday, June 28, 6:00 to 7:30 p.m. during the American Medical Association Meeting. The party will be held in the Oak Room, National Guard Armory, 33rd St., and Park Ave., New York. All members of the Association of Military Surgeons, whether members of the New York Chapter or not, are invited. This, of course, includes the ladies. Reservations at $3.50 per person. Tickets will also be available at the American Medical Association Meeting.

New Members

Col. Clare T. Budge, DC, USA
Lt. Col. Muriel R. Carbery, ANC, USAR
Major Amos E. Light, MSC, USAR
Capt. Max E. Mitchell, DC, AUS
Lt. Col. Albert W. Moulton, Jr.
Col. Walter S. Walls, MC, USAR
Major Sidney M. Silverstone, MC, AUS
Capt. Isidore Stein, MC, USA
George Tolstoi, M.D.
Capt. Leon Warren Harmon, USAE, MSC
Lt. Col. Charles E. Russell, MC, USAR
Lt. Col. Charles B. Gault, MSC, USA
Major F. G. Fentriss, AN, USA
Lt. Col Ann E. Hogan, ANC, USA
Capt. William W. Anthony, MSC, USA
Col. Harold P. Larson, MSC, USA
Capt. Claude A. Ledwell, MSC, USA
Maj. Bruce Frederick Chandler, MC, USA
Capt. Basil M. RuDusky, MD., MC, USAR
Cdr. Anthony Thomas Zukoski, DC, USNR
1/Lt. Jack O. Lanier, MSC, USA
LCdr. Margaret R. Ruppert, MC, USN
Sr. Asst. Ther. Dorothy C. Shumer, USPHSR
Capt. Donald P. Roach, MC, USAR
Major Mayna R. Allen, ANC, USA
Major Joseph J. John, USAF, MC
Capt. Mary H. McClelland, ANC, USA
N. O. Doris D. Day, USPHS
Major Ilene O. King, ANC, USA
Lt. Col Emilie K. Jensen, ANC, USA
Bernard H. Gagnon, M.D.
Major Anna V. Skovira, ANC, USA
Major Isabel S. Paulson, ANC, USA
Asst. N. O. Sidney S. Louis, USPHS
Sr. N. O. Catherine M. Thompson, USPHS
N. O. Lena Faye Turner, USPHS
N. O. Marie H. Van Son, USPHS
Med. Dir. Henry A. Holle, USPHS
Captain John A. C. Gray, MC, USN
Lt. Col. Oscar Glassman, AUS, MC
Capt. Mims C. Aultman, MC, USAR
Colonel William H. Crosby, MC, USA
Mrs. Bessie H. Graham, VA
Lt. Col. Samuel Hurewitz, MC, USA
Sr. Surg. Thomas J. Kennedy, Jr., USPHS
Capt. Regina Pak, ANC, USA
Capt. John Gehringer, ANC, USA
LCDR. M. William Voss, MC, USN

MEMBERSHIP COMMITTEE

Commander Calvin F. Johnson, MSC, U. S. Navy, Chairman
Mr. George F. Archambault, U. S. Public Health Service
Commander Burdette M. Blaska, NC, U. S. Navy
Lt. Col. Jesse W. Brumfield, MSC, U. S. Army
Lt. Col. Nathan Cooper, U. S. Air Force, (MSC)
Mr. Vernon O. Trystad, Veterans Administration

Honor Roll

Lt. Col. Jesse W. Brumfield, MSC, USA
Med. Dir. Lee D. Gehrig, USPHS
Lt. Tseng-Yu Chiao, Chinese Air Force
Maj. Serafin M. Dominguez, MC, USAR
Dr. F. K. Mostofi
Lt. Col. Alfred A. Gentilcore, USAFR, MSC
Lt. Col. Edward Barrett, MC, USAR

Deaths

ARUNDEL, Hugh F. J., Colonel, Veterinary Corps, Reserve, U. S. Army, Retired, died at Statesboro, Georgia, February 27. He was retired from military service on November 12, 1946.

He is survived by his wife and a daughter, Captain Janice C. Arundel, AMSC, Ft. Leonard Wood, Mo. Internment was in Arlington National Cemetery.

CALLARD, Charles Beresford, Colonel, Medical Corps, U. S. Army, Retired, died February 27, 1961, at the Naval Air Station Hospital, Pensacola, Florida. His age was 78.

Dr. Callard was a native of London, Ontario, Canada, and had received his medical degree at the University of Western Ontario in 1903. In 1917 he joined the Idaho National Guard. During World War I, he served with the American Expeditionary Forces in France and later with the American Army of Occupation in Germany. He was commissioned in the Medical Corps of the Regular Army in 1919 and served until his retirement in September 1946.

He further studied at the New York Polyclinic Medical School and Hospital 1913; the Army Medical School, Washington, D.C., 1925; the Army Medical Field Service School, 1925; and the Advanced Course of that school in 1934.

During World War II, after serving from 1938 to 1942 as Commanding Officer of the hospital, Fort Barrancas, Fla., he served as Commanding Officer of the Regional Hospital and Post Surgeon at Camp Blanding, Florida, until his retirement. Since that time he had been making his home at Pensacola, Fla.

He is survived by his wife of Pensacola, Florida, 130 Sixth St., East Pensacola Heights, and a daughter, Mrs. Barbara Naftaly, 3132 State St., Drive, New Orleans, La.

Internment was at Arlington National Cemetery.

COOPER, Lenna D., first Supervising Dietitian in the Office of the Army Surgeon General, died on 23 February at the age of 86.

Miss Cooper finished her nurses' training at Battle Creek Sanitarium in 1901, and after working there with Dr. John Harvey Kellogg developed an interest in food and food chemistry, and went to Philadelphia for two years at the Drexel Institute, finally earning her bachelor's and master's degrees from Teachers College, Columbia University. She then returned to Battle Creek and initiated the first School of Home Economics there, just prior to World War I.

When the Army was faced with the gigantic job of feeding its expanded military forces, Miss Cooper was selected the first supervising dietition by The Surgeon General. She took the oath of office in civilian status on Armistice Day, 1918. She remained on duty until August 1919, and ably laid the groundwork for the present Dietitian's Section of the Army Medical Specialist Corps.

Miss Cooper was instrumental in forming the American Dietetics Association, serving first as its vice-president, and later as President in 1937-38. She co-authored a book on "Nutrition in Health and Disease," which is used as a standard text for nurses and dietetic interns.

MICHAEL, W. Howard, Rear Admiral, Medical Corps, U. S. Navy, Retired, died February 14. He is survived by his widow whose address is: P.O. Box 237, Chuckatuck, Va., and a daughter, Mrs. J. H. Boyum, wife of Captain Boyum, Navy Dep't., Washington.

NEW BOOKS

Books May Be Ordered Through The Association

Evaluation of Drug Therapy, Proceedings of the Symposium on Evaluation of Drug Therapy in Neurologic and Sensory Diseases held at the University of Wisconsin, May, 1960. Edited by Francis M. Forster, M.D. University of Wisconsin Press. Price $4.00.

The War At Sea. History of the second World War. Vol. III, Part, I. By Captain S. W. Roskill, D.S.C., R.N. Her Britannic Majesty's Stationery Office, London. Price $8.10.

Drugs and Behavior. Edited by Leonard Uhr and James G. Miller; sixty-three contributors. John Wiley & Sons, Inc., New York. Price $10.75.

Systemic Lupus Erythematosus. By Daniel L. Larson, M.D. Little Brown and Company, Boston. Price $7.50.

Clinical Pharmacology. By D. R. Laurence, M.D., M.R.C.P., and R. Moulton, M.D. Little, Brown and Company, Boston. Price $10.00.

A Synopsis of Contemporary Psychiatry. 2nd Ed. By George A. Ulett, B.A., M.S., Ph.D., M.D.; and D. Wells Goodrich, M.D. The C. V. Mosby Company, St Louis. Price $6.50.

The Choice of a Medical Career. Essays on the Fields of Medicine. Edited by Joseph Garland, M.D., Sc. D., and Jospeh Stokes, III, M.D. J. B. Lippincott Company, Philadelphia. Price $5.00.

Some Reflections On Genius and Other Essays. By Russell Brain. J. B. Lippincott Company, Philadelphia and Montreal. Price $6.00.

Neurovascular Compression Syndromes Of The Shoulder Girdle. By Louis M. Rosati, M.D., and Jere W. Lord, M.D. Grune & Stratton, New York and London. Price $7.50.

Cardio-Vascular Surgery. A Manual for Nurses. By Members of the Surgical Staff and Members of the Nursing Service Staff, The Methodist Hospital, Texas Medical Center. Edited by George H. Peddie, M.D., and Frances E. Brush, R.N. G. P. Putnam's Sons, New York. Price $2.75.

The Chemical Warfare Service: From Laboratory to Field. By Dr. Lep P. Brophy, Dr. Wyndham D. Miles, and Dr. Rexmond C. Cochrane. This is the 51st volume published in the series U.S. Army in World War II; 2nd volume in the Chemical Corps group. Government Printing Office, Washington, D.C. Price $3.50.

An Atlas Of Bronchoscopy. By A. Huzly, M.D., in charge of the Surgical Division at the Sanatorium Schillerhoehe of the Lva Wurtemberg Stuttgart-Gerlingen. Grune & Stratton, Inc., New York. Price $12.50.

Manual of Kinesiology. 4th Ed. By Clem W. Thompson, Ph.D., F.A.C.S.M. The C. V. Mosby Company, St. Louis. Price $3.75.

Orthopaedia. Translated from the French of Nicolas Andry; a photographic reproduction of the first English edition of 1743. Two vols., boxed. J. B. Lippincott Company, Philadelphia and Montreal. Price $10.00.

Recent Advances In Renal Disease. The Proceedings of a Conference in London at the Royal College of Physicians of London, 22nd-23rd July 1960. Edited by M. D. Milne. J. B. Lippincott Company, Philadelphia and Montreal. Price $5.00.

Oral Physiology. By Sidney I. Silverman, B.S., D.D.S., F.A.C.D. The C. V. Mobsy Company, St. Louis. Price $15.00.

Recent Advances in Tropical Medicine. 3rd Ed. By Sir Neil Hamilton Fairley, K.B.E., M.D., D.Sc., F.R.C.P., F.R.A.C.P., D.T.M. & H.; A. W. Woodruff, M.D., Ph.D., F.R.C.P., D.T.M. & H.; and J. H. Walters, M.D., F.R.C.P., Lt. Col. I.M.S. (Ret.). Distributed in the United States and Possessions by Little, Brown and Company, Boston. Price $11.00.

The Couch and The Circle. A story of Group Psychotherapy. By Hyman Spotnitz, M.D., Med. Sc.D. Alfred A. Knopf, New York. Price $4.50.

Anatomy and Physiology for Radiographers. By C. K. Warrick, M.B., B.S., M.R.C.S., L.R.C.P., F.R.C.S., F.F.R., D.M.R. The Williams & Wilkins Co., Baltimore, exclusive U.S. agents. Price $7.00.

Management of Fractures, Dislocations, and Sprains. 7th Ed. By H. Earle Conwell, M.D., F.A.C.S. and Fred C. Reynolds, M.D. The C. V. Mosby Co., St. Louis. Price $27.00.

Recent Advances in Human Genetics. Edited by L. S. Penrose, M.A., M.D., F.R.S.; with assistance of Helen Lang Brown. Little, Brown and Company, Boston. Price $8.00.

Neuromuscular Disorders. The Motor Unit and Its Disorders. Proceedings of the Association for Research in Nervous and Mental Disease, December 1958, New York. The Williams and Wilkins Company, Baltimore. Price $20.00.

Science in Space. By Dr. L. V. Berkner and Dr. Hugh Odishaw. McGraw-Hill Book Company, New York. Price $7.00.

Specifications For Pesticides. 2nd Ed., World Health Organization. Columbia University Press, International Documents Service, New York. Price $10.00.

BOOK REVIEWS

IMPORTANCE OF THE VITREOUS BODY IN RETINA SURGERY WITH SPECIAL EMPHASIS ON REOPERATIONS. Second Conference of the Retina Foundation, May 30 and 31, 1958. Edited by Charles L. Schepens, M.D. 226 pp., illust. The C. V. Mosby Company, St. Louis. Price $15.00.

This publication reviews the presentations given by a distinguished panel of speakers during the Second Conference of the Retina Foundation in May of 1958 conducted for the purpose of better understanding the problems of retinal separation.

Dr. L. E. Zimmerman and Dr. B. R. Straatsma beautifully and succinctly present the evidence suggesting an intimate union between the retina and vitreous, the importance of an acid mucopolysaccharide for the degree of adherence between the outer and inner neuroectodermal layers of the retina and supplement their points with very fine illustrative histologic studies.

Dr. E. A. Balzs reports on the major macromolecular components of the vitreous body and compares such components in the human eye with that of various animal species. He suggests that the increased hyaluronic concentration in the cortical vitreous arises from the metabolism of vitreous cells in this region, that this acid serves as a molecular sieve restricting the diffusion of macromolecular elements throughout the vitreous itself and impeding cellular invasion from without into the vitreous. The phase-contrast photographs of these vitreous cells are magnificent. His presentation indicates that the collagen gel is sensitive to radiation and that ascorbic acid is responsible for the ultraviolet absorption by vitreous and aqueous humor as well as determining the viscosity of liquid vitreous.

Dr. T. R. Smith shows with splendid histologic sections the pathologic findings found after retina surgery, i.e. cellular membrane on the inner aspect of the internal limiting membrane, retinal folds, vitreous retraction, glassy membrane formation, retinal breaks, vitreous alterations, and vitreo-retinal adhesions.

Dr. D. M. Shafer presents his technique of obtaining, storing and implanting vitreous aspirate, and his clinical indications for its use. His statistics on the result of "vitreous implant" surgery with the standard of success being a retina reattached for six months or longer reveal a series of approximately 40 per cent success. This and his data leading to his statement that "The visual results in 37 eyes which were successfully reattached showed that more than 80 per cent recovered 20/200 or better (Table 6)," will encourage others to adopt his method. However, this enthusiasm might well be tempered since the reader can from the same data in Table 6 with equal reliability conclude that slightly more than 40 per cent of those patients had no more than 20/200 resultant visual acuity.

Dr. C. C. Teng associates congenital retinal rosettes, glial cell proliferation, and "hyaloid membrane" disinsertions as factors in retinal separation.

Dr. K. Hruby emphasizes the value of the clinical examination of the vitreous with the slit lamp and its adjuncts to determine the degree of vitreous detachment, vitreous collapse, the presence of retinal breaks and correlates these findings with the results of retinal surgery.

Dr. C. L. Schepens stresses the value of indirect stereoscopic ophthalmoscopy with scleral indentation, the significance of various kinds of folds, dialysis, massive vitreous retraction, and vitreous proliferations in respect to results of surgery, and makes very pertinent comments as to unfortunate iatrogenic contributions that diminish the probability of successful retinal surgery.

Dr. D. K. Pischel lucidly reviews the scleral resection, his indications for this surgery, appropriately quotes Gonin that the most important instrument for curing a retinal separation is still the ophthalmoscope, re-emphasizes the value of the slit lamp and aids to study the vitreous, favors lamellar resection in cases of "retinal shortage" and discusses the preferred position of the retinal roll in reference to retinal breaks.

Dr. E. Custodis discusses the technique of scleral buckling without excision and with polyviol implant. Dr. I. Okamura's topic is the technique of scleral buckling procedures with excision.

Each section is followed by a fine Discussion consisting of questions and answers. The bibliography is adequate. The paper and binding of the book are excellent.

This book is "must"-reading for the ophthalmologist. The participants in the Symposium are to be congratulated. Dr. C. L. Schepens who has edited the work has done a very fine job.

CAPT. R. P. NADBATH, MC, USN

CLINICAL ORTHOPAEDICS. No. 18. Internal Derangement of the Knee Joint. Editor-in-Chief, Anthony F. DePalma, with Assistance of the Associate Editors, The Board of Advisory Editors, and The Board of Corresponding Editors.

293 pp., illust. J. B. Lippincott Company, Philadelphia and Montreal. Price $7.50.

This book follows the pattern of its predecessors. Dr. Fremont A. Chandler is eulogized in an inspiring opening chapter. The major task, "Internal Derangement of the Knee Joint" occupies Section I, and several well-known authorities are represented. Dr. John Charnley of England discusses arthrodesis of the knee. Drs. Mazet and Urist write of their method of knee arthrodesis using an intramedullary nail in the femur and tibia for fixation. The late Duncan McKeever is represented in his article on "Tibial Plateau Prosthesis." Of interest was the reporting by Dr. Robert Abrams of the removal of a torn medial meniscus in a 5 year old child, and of his reporting of a case of Dr. Naughton Dunn's in which a discoid lateral meniscus was removed in a 4 year old child. "Popliteal Cysts and Posterior Lesions of the Medial Meniscus" by Dr. Harold Childress brings out the diagnostic tests necessary for diagnosis. The reviewer feels that the so-called "duck-waddle" test antedates the author's claim for originality, having been used for a number of years in screening Naval Academy applicants. This fine article warrants re-reading.

Section II on General Orthopaedics has an outstanding article by Dr. Paul Harmon on "Anterior Extraperitoneal Lumbar Disc Excision and Vertebral Body Fusion," and the illustrations and descriptions are such that the reviewer feels that the relative safety of the posterior approach is reinforced.

Section III on Items presents an incredible case on "A Method of Reduction of the Dislocated Hip Without Anesthesia." However, on careful reading one realizes that this case was that of a century and a half ago. One cannot help but count his blessings, which include the modern tools of x-rays and good anesthesia.

In summary, this volume enhances one's grasp of many clinical orthopaedic problems, and thereby justifies its title. It is well-edited, printed in clear type, and uses line drawings and photographic reproductions liberally to further clarify the good exposition. It is recommended to all orthopaedic and general surgeons interested in orthopaedics.

CAPT. ROBERT H. BROWN, MC, USN

VALVULAR DISEASE OF THE HEART IN OLD AGE. By P. D. Bedford, M.D., M.R.C.P., and F. I. Caird, D.M., M.R.C.P. 194 pp., 38 illust. Little, Brown and Company, Boston. Price $7.50.

This monograph of 185 pages deals with the study of valvular heart disease in the aged. The material for this study was obtained from the Geriatric Unit, Cowley Road Hospital, Oxford, England, from 1949 to 1956. There were 3,124 patients, aged 65 or older, admitted during this period. Four hundred nineteen patients were diagnosed as having valvular heart disease. There were 215 autopsies performed of the 330 known dead.

The authors believe that valvular heart disease in old people is rarely correctly made. The sources of error in making the diagnosis, with a comparison of the features between the younger and older patients with heart disease, is discussed. The diagnostic criteria such as auscultatory signs, rhythms, pulse, blood pressure, radiology, and electrocardiology is covered in each of the types of valvular disease. Rheumatic heart disease has the most prominent place in this book, at it should. The chapter on isolated aortic incompetence in the aged is interesting and is in agreement with most authorities as to its etiology and prognosis.

The natural history of valvular heart disease is discussed with a statistical reference to both the literature and to this group.

Complications of valvular heart disease in old age, including congestive heart failure, systemic and pulmonary emboli and factors concerned in anticoagulant therapy are concisely and adequately discussed.

The value of such a volume as this study represents is, as a reference in a brief and concise manner, a summary of the literature, plus their own comments regarding the authors' observations and experience in this field.

COL. D. O. LYNN, MC, USA

CLINICAL CARDIOPULMONARY PHYSIOLOGY. 2nd Edition, revised and enlarged. Sponsored by The American College of Chest Physicians. 92 contributors. 1001 pp., illust. Grune & Stratton, New York and London. Price $28.50.

It is recorded that Hippocrates believed that the arteries contained air and the veins contained the blood of the body; Galen's erroneous teachings regarding the circulatory system persisted for over 14 centuries; World War II and the explosive development of the air age demanded knowledge of cardiopulmonary physiology which was not available at the time. Tremendous advances have taken place in this field in a very short span of years. This book beautifully organizes the pertinent information now available. Because of the voluminous world wide literature dealing with developments in cardiopulmonary physiology, it has been impossible for any one person to master the material entirely. Recognizing this, the American College of Chest Physicians, in 1957, sponsored a volume edited by a board of specialists in this expansive field. Numerous clinicians and researchers contributed authoritative chapters covering their special interests. The need for such a volume was immediately confirmed by the fact that the first edition was sold out at an early date.

This second edition is published to satisfy the

obvious demand for such an accumulation of data and to bring up to date the advances that have occurred in the past few years.

This volume is more logically arranged than the first. Anatomical, physiological, diagnostic and therapeutic aspects are considered in normal, congenital and acquired disease conditions. Some twenty additional subjects are included in this edition.

The techniques employed in cardiac catheterization, cinecardioangiography, pulmonary function studies, evaluation of cardiac and pulmonary disabilities, atmospheric conditions of cities, altitude physiology in the jet air travel age, blast biology, the physiologic problems in cardiac and pulmonary surgery are only a few of the 63 general topics discussed.

New hopes for the surgical correction of certain forms of coronary artery disease has made this an exciting subject in recent years. The excellent chapter on anatomy of the heart and the illustrations demonstrating the vascular patterns indicate the tenor of the possibilities of the future in this phase of research.

Several newer techniques of study are described which have not reached the stage of development or quantitation necessary for practical clinical applications, for example, the kinetocardiogram. A practical means of using work tests for evaluation of cardiac and pulmonary functional capacity and exercise tolerance tests may be particularly helpful to those dealing with industrial and medical-legal problems.

Cardiac resuscitation, the use of the pacemaker and the mechanisms and treatments of arrhythmias are current subjects all physicians must understand.

The concept of the hyperkinetic cardiovascular syndrome is concisely presented in a clinically helpful manner. The term is used to cover that group of conditions of numerous etiologies in which there is an increase in cardiac output with a decrease in the peripherovascular resistance and an increased rate of venous return, the so-called high output failure type of problem.

Details of pulmonary anatomy and normal respiratory physiology are well covered. Cor pulmonale is extensively discussed. Details are given for conducting pulmonary function tests, blood gas analysis and functional chest fluoroscopy.

Some chapters deal with specific cardiac and pulmonary diseases from the viewpoint of etiology, diagnosis, physiology and treatment of those conditions. Adequate discussion of the esophagus and mediastinum complete the coverage of all structures contained in the thorax.

There are numerous tables, charts, photographs, electrocardiograms and drawings of exceptional detail and quality. The photographs of X-rays in the chapters on roentgen physiology of the cardiovascular system and cinecardioangiography have been well selected and reproduced. Most chapters have good bibliographies, a pattern generally followed in books sponsored by the American College of Chest Physicians.

The index is, unfortunately, rather limited. General topics are listed but the breakdown is not as complete as a volume of this magnitude deserves. The publisher has provided a good binding and a paper of lasting quality and pleasant texture, with a clear and easily readable type. This is a large desk-type volume and obviously represents a tremendous amount of effort. It particularly belongs to those specialists doing cardiac and pulmonary work who will be most grateful for this new edition. Libraries should have the volume for a reference, since all physicians will find it to be the most readily available source for answers to their questions in this field.

HENRY L. HOOK, M.D.

OBSTETRICS. From Original Text of Joseph B. De Lee. 12th Ed. J. B. Greenhill, M.D., F.A.C.S., F.I.C.S.; and 23 contributors. 1098 pp., profusely illustrated. W. B. Saunders Company, Philadelphia and London. Price $17.00.

The author of this outstanding text presents his 5th edition to the original seven editions previously prepared by Joseph B. De Lee. Due to the many recent advances in the practice of obstetrics, Dr. Greenhill in addition to presenting the subject matter derived from his vast clinical experience, has added contributions to his book from many authors well known in the field of obstetrics.

New chapters contain important and up to the minute data concerning the physiology and biochemistry of the placenta, nutrition, in pregnancy, endocrine changes in normal pregnancy, the mechanism of labor and the puerperium, the toxemias of pregnancy diseases of the heart, circulatory system, blood digestive tract, kidneys, lungs, eyes, ears, nose and nervous system, endocrine diseases, fetal erythroblastosis, diseases of the chorion, pathology of the newborn, brain injury and its sequels, and medicomoral problems.

This book furnishes the student a practical approach to the subject of obstetrics and gives him the proper comprehension of the importance of this subject in this field of medicine. The practioner will find a wealth of detail and numerous illustrations that will assist him in accomplishing his obstetrical program.

COL. JOHN W. DARROUGH, MC, USAR